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Taxonomy and Distribution of *Rhynchospora* (Cyperaceae) in the Guianas, South America

by

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ABSTRACT

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Seventy-seven species and three infraspecific taxa in 19 sections of *Rhynchospora* Vahl *nom. conserv.* (Cyperaceae) are found to occur in the Guianas (Guyana, Suriname, and French Guiana), South America. A new section, ***Stipitatae*** M. T. Strong is described. Two synonyms of accepted taxa are lectotypified: ***Rhynchospora filiformis*** var. ***latifolia*** Uittien and ***Rhynchospora graminea*** Uittien. The species were taxonomically evaluated and circumscribed based on laboratory studies of micromorphological achene characters utilizing SEM, morphological herbarium studies of dried specimen collections, information on relationships between species from other studies published in the literature, habitat characterization, and distribution patterns. The infrageneric classification of *Rhynchospora* is discussed and morphological characteristics of the genus and recent cytological advances are reviewed. A taxonomic treatment is provided that includes a key to species, full detailed descriptions, distribution maps, SEM photomicrographs of all 80 taxa including images of the whole achene (fruit) and detail of the pericarp, line drawings for selected species, and notes on habitat, distribution, nomenclature, and distinguishing features.

KEY WORDS: Cyperaceae, French Guiana, Guianas, Guyana, Nomenclature, *Rhynchospora*, Suriname, Taxonomy

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Cover Design by Alice R. Tangerini: front, habit of *Rhynchospora bolivarana* Steyerm.(*Clarke 5472 & 9234*) illustrated by ART; back, detail of *Rhynchospora divaricata* (Ham.) M. T. Strong (A, from *Anderson 8035 & Maas et al. 7285*; B-J, from *Anderson 8035*; K, from *Broadway 544*) illustrated by ART.

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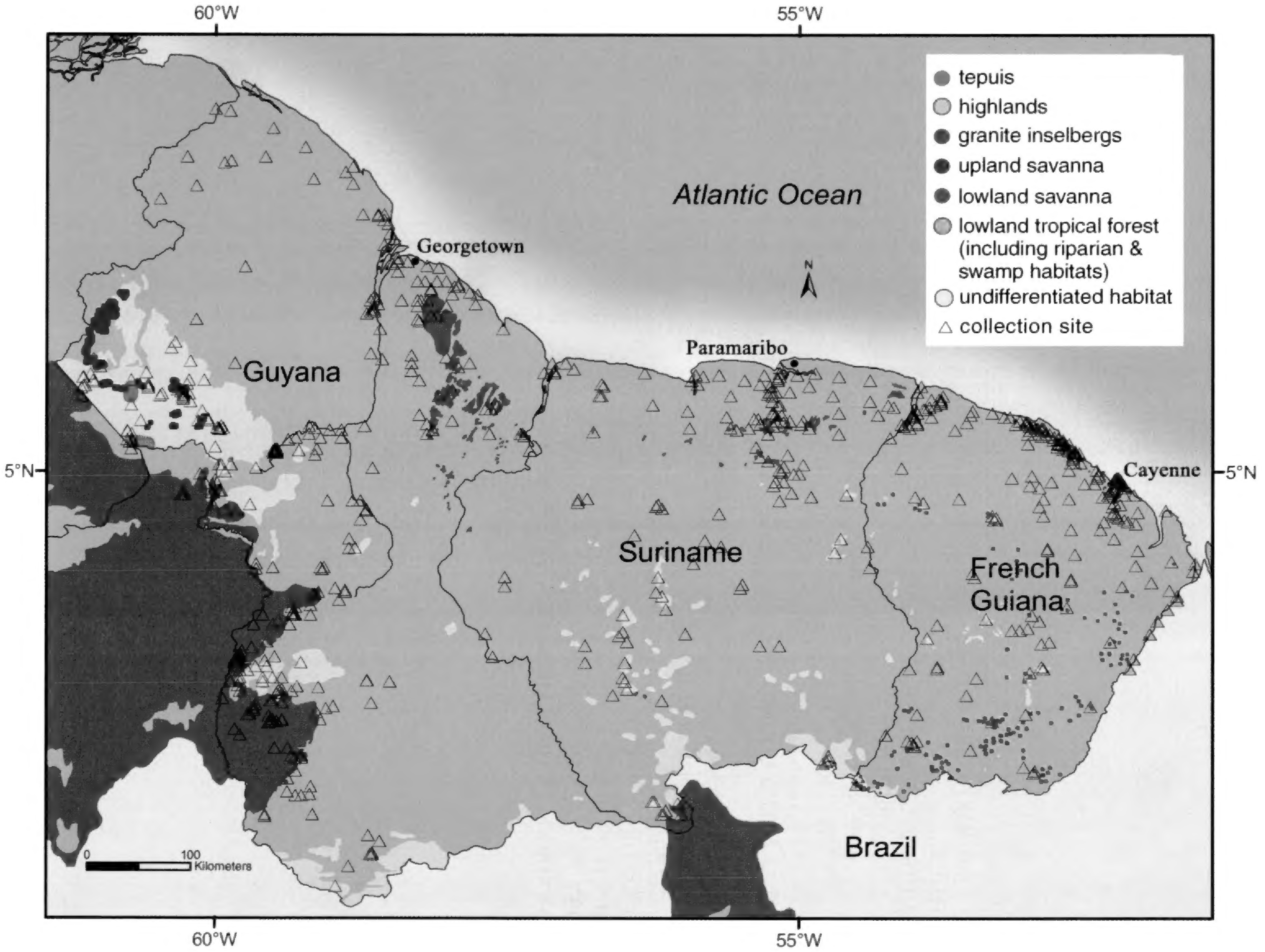
60°W
55°W
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5°N
tepuis
highlands
granite inselbergs
upland savanna
lowland savanna
lowland tropical forest (including riparian & swamp habitats)
undifferentiated habitat
collection site
Atlantic Ocean
N
Georgetown
Paramaribo
Cayenne
Guyana
Suriname
French Guiana
Brazil
0
100
Kilometers
60°W
55°W

Taxonomy and Distribution of *Rhynchospora* (Cyperaceae) in the Guianas, South America

Mark T. Strong[1]

INTRODUCTION

Rhynchospora Vahl has its center of distribution in the Americas, primarily in warm temperate zones (southeastern United States) and the Neotropics, with about 270 species worldwide. It has the largest representation of Cyperaceae species occurring in the Guianas (Guyana, Suriname, and French Guiana), which accounts for about 1/3 of all *Rhynchospora* species. Many of these taxa occur in restricted microhabitats and are rare or poorly known, while others represent new species that have only recently been discovered and described (Strong 2001, 2005). Other than the treatment of *Rhynchospora* given for Cyperaceae in Flora of Suriname (Uittien 1934) and a later synopsis of species occurring in Suriname (Lindeman and Van Donselaar 1971), no treatment has been done that taxonomically circumscribes or covers all the species that occur in the Guianas. Although Kükenthal (1950) published a monumental worldwide monograph of *Rhynchospora*, it is limited in that it treats only those species that he had seen. His descriptions are short with very little detail on characters needed to definitively identify species. His keys are often too general, and there are no illustrations to compare taxa. Later work on selected *Rhynchospora* species in the Guayana Highlands (Venezuela) by Koyama (1972), and a synopsis of *Rhynchospora* for the Venezuelan Guayana by Thomas (1998), have laid a solid foundation for further work on species occurring in northern South America. However, no comprehensive treatment has been done that includes keys to species, full detailed descriptions, illustrations, and range maps.

The embryo and achene of Cyperaceae have been the most useful characteristics in describing relationships among tribes, circumscribing species, and for identification purposes. Our knowledge of relationships in Cyperaceae today is primarily based on the seminal embryo studies done by Van der Veken in 1965. For many species, particularly in *Rhynchospora*, identification is based primarily on characters of the achene including style base and bristles. With the development of the scanning electron microscope in recent years, systematists are finding it useful in circumscribing and reevaluating these characteristics for both phylogenetic and taxonomic studies. As a consequence, the highly detailed aesthetic qualities of fruit ornamentation are revealed that cannot be rendered sufficiently in line illustrations. *Rhynchospora* can be distinguished from other Cyperaceae by a combination of spikelet and floral characteristics. Spikelets (the inflorescence unit of most Cyperaceae) are typically rounded in cross section, ovoid to lanceoloid or linear-lanceoloid. The spikelet scales are spirally imbricate and spread out only when the fruit is fully mature. They are dorsally obtuse or rounded, have a single, very slender, midcosta that is often prolonged as a mucro or short awn at the apex, and the sides are very finely cellular-striate. There are generally 1 to 3 or sometimes more smaller empty scales at the base of the spikelet and above these are larger scales which subtend flowers. The ovary of the flower has a 2-branched, bi-lobed, or sometimes undivided style, and sometimes bears bristles at its base that are persistent on the mature fruit (achene). The achenes are 2-sided and their apex is crowned by the persistent often expanded base of the style which is often referred to as the beak (hence the common name, beak-rush) or in this treatment,

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"style base".

Sixty of the eighty taxa (75%) of *Rhynchospora* occurring in the Guianas, are found in some type of savanna habitat. These habitats occur in uplands on sandstone remnants of the Roraima formation, on granitic rock outcrops of the Guianan shield, or open lowland and coastal plains. Savanna is one of the major ecosystems on the earth's surface. It was defined by Beard (1953) as 'a plant formation of tropical America comprising a virtually continuous and ecologically dominant stratum of more or less xeromorphic herbs of which grasses and sedges are the principal components, with scattered shrubs, trees or palms sometimes present'. South American savannas comprise approximately one-sixth of the earth's savanna habitat (Hills 1976). These lie within the savanna belts that extend over some 15-20° of latitude between the Tropics and the Equator and are associated with the tropical wet and dry climate type. In northern South America, savannas occur where the climate is characterized by an annual dry season and temperatures that are consistently high. The soil water balance in an ecosystem is generally influenced by the rate of evapotranspiration. In savannas, daily evapotranspiration rates have been estimated to vary from 4-10 mm during the dry season to 2-4 mm during the wet season with annual totals varying from 1000-1500 mm or more, depending on how long the dry season is. Mean monthly temperatures range from 25-30°C during the warmest months and 13-18°C during the coolest months. Because of the extended annual dry season in northern South American savannas, only drought tolerant plant species such as C_4 grasses and sedges, some deciduous trees, those with deep root systems, and trees or shrubs with thick sclerophyllous leathery leaves tend to dominate these ecosystems. The various forms of savanna vegetation are interrelated not only to climatic and soil conditions, but also to geological events and geomorphological evolution of the landscape over a long period of time (Cole 1986).

Although the economic importance of Cyperaceae is not as well documented or as broad as that of other plant families, e.g., the grass family (Poaceae) in which many grains are processed for food worldwide, about 500 species have been identified of economic importance at the regional or local level where some play a vital part in local economies. Ten taxa of *Rhynchospora* are listed by Simpson and Inglis (2001) as having economic or ethnobotanical importance. Eight of these occur in the Guianas, primarily in savanna habitat. Some of these are used locally for medicinal or ceremonial purposes by Amerindians while others provide food for foraging animals.

Nine of the species treated in this study occur on the boggy summits or granitic outcroppings of a number of the higher mountains in Guyana and Suriname. These include Mt. Ayanganna, Mt. Kopinang, Mt. Maringma, Mt. Wokamong, Mt. Roraima, and the Kanuku mountains in Guyana, and the Bakhuis and Emma Keten mountains in Suriname. Plants found on these higher mountain summits in the Guianas and Guayana Highlands of Venezuela typically form unique plant communities of genera and species that are restricted to these habitats. The status and recorded occurrence of *Rhynchospora* species in these habitats will help aid in the assessment of these ecosystems as critical areas for possible consideration as protected natural areas. For example, in Guyana, delineation of critical habitat is being done by the Smithsonian Institution's Biodiversity of the Guiana Shield Program for the Guyana government based on collection localities for both plant and animal species (World Bank 1998).

This study endeavors to clarify the taxonomy of *Rhynchospora* species occurring in northern South America. This work covers all the taxa in the three Guianas (Guyana, Suriname, and French Guiana) whereas only those taxa occurring in Suriname have been treated previously. This treatment provides botanists, ecologists and systematists alike with a plethora of information on Rhynchospora, including micrographs of the mature achenes (fruits) where only a few have been previously represented in line drawings, cytological information, definitive descriptions, a key to identify species, clarification of nomenclature, citation of types, habitat, distribution, and specimen information. In addition, this treatise will be useful as a reference for botanists and ecologists working to assess the sedge (Cyperaceae) flora of particular habitats in this region, particularly savanna habitats. Ultimately, this work will provide a foundation for further systematic studies in the group and be used within the broader context of a flora of the three

Guianas, a project being done by a consortium of institutions coordinated by the Smithsonian Institution, Washington, DC, and the University of Utrect, the Netherlands.

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METHODS

Data for this study was gathered from herbarium and laboratory studies. Complete herbarium collections from the Guianas including types for each species were examined at or borrowed from major herbaria, including B, BRG, C, CAY, CGE, F, G, GH, K, M, MO, NY, P, U, and US. A recording form with an outline of descriptive characters was used to tabulate descriptive data from each of the 2,242 specimens examined. Descriptive information was also recorded from specimens outside the study area as well so that a more definitive characterization of the plant could be represented.

A record of each specimen, based on information taken from specimen labels, including its locality, coordinates (latitude/longitude), collection data (collector, collection number, and date), and habitat data, were compiled into a database. Gazetteers were consulted to obtain coordinate data not given on specimen labels or to help pinpoint localities. These included Hoff and Cremers 1995; Defense Mapping Agency gazetteers of Guyana, Suriname, and French Guiana 1993; Hoff et al. 1990; Stephens and Traylor 1985; and Ministry of National Development and Agriculture (Guyana) 1974. Indices of plant collectors (Ek 1990; 1991) were consulted as well to help standardize collectors names and to confirm collecting localities. This information was used to circumscribe habitat and distribution of species within the Guianas. Maps showing the range of each species within the Guianas and one showing major habitats (vegetation types) where *Rhynchospora* occur in the Guianas (e.g., lowland savanna, upland montane forest, etc.), were also produced from this data. These were done by utilizing digitized base maps for each country [available from the Biodiversity of the Guiana Shield Program (BDGSP), Smithsonian Institution] and then manually digitizing the habitat types. Data for the base maps were obtained from Landsat-5 satellite images and those for the habitat types were from published vegetation maps (Huber et al. 1995; The National Planning Office of Suriname 1988; Centre d'Etudes de Géographie Tropicale du C.N.R.S. 1979). All maps were produced using the GIS software program, ARCMAP. Of the 2,242 specimens examined, 143 were not geo-referenced. These lacked specific localities, most indicating a

country only. However, on the maps produced, species represented by these 143 collections were recorded in their corresponding countries from other collections that were geo-referenced based on specific localities or coordinates recorded from the specimen labels.

Achene micromorphology, including epidermal surface features for each species was studied using a Leica StereoScan 440, Scanning Electron Microscope (SEM) and documented with digital images. Whole mature fruits (achenes) were dissected from selected specimens and then mounted on 2-inch SEM stubs using press-on, double-sided tape tabs. The mounted achenes were then carbon-coated so that they could be observed under SEM. Digital images were taken of both the whole achene and a detail of the epidermal cells. These images were then saved as files and later brought up utilizing a computer software package (PHOTOSHOP 5.5) which was used to produce the plates. This work was based on the authors' Ph.D. dissertation which was completed in 2004 at George Mason University, Fairfax, Virginia.

RESULTS AND DISCUSSION

MORPHOLOGY

In habit, species of *Rhynchospora* are very diverse vegetatively and can range from diminutive annuals less than 10 cm high to large rhizomatous perennials up to 3 meters tall. In general, they are perennials with short, hardened, knotty, sometimes horizontally creeping, rhizomes or rarely the rhizomes producing long, cord-like stolons. Species with an annual habit are less frequently encountered in the genus. In the Guianas, those that are annuals, are typically low caespitose plants, bearing dense tufts of leaves and culms, and often are species of *Rhynchospora* sections *Tenues* and *Psilocarya*. They are generally associated with open sand savanna and swale habitats. The culms of *Rhynchospora* are borne in proximate groups or singly from the rhizome, rarely at short intervals or in distinct rows from a horizontally creeping rhizome. Generally, the culms are trigonous or obtusely so, and in the rhizomatous perennials, they are hard and stiffened and often channeled along one side distally.

Leaves are 3-ranked and are generally borne primarily at the base of the culm at short intervals with several often lower cauline. However, in scandent species, they are typically noded at regular intervals up to the inflorescence. On some perennial species, fibrous remnants of old sheath bases from previous growing seasons persist below new growth. Basal sheaths are generally short and split along the more friable inner band as the plant matures. Lower cauline leaves generally have well-developed sheaths and leaf blades. The inner band of the sheath is often herbaceous or membranous distally with a concave to truncate orifice. The ligule in *Rhynchospora* is rarely developed, but when present, is generally a narrow band of tissue or appressed trichomes at junction of the sheath apex and base of the leaf blade. Based on species in the Guianas, the presence or absence of a ligule in *Rhynchospora* does not appear to be section-specific. Leaf blades are dorsiventrally compressed and have a prominent midvein. The margins and abaxial midvein are generally antrorsely scabrous. They range from linear flattened or V-shaped (in cross section) with attenuate, triquetrous apices in the larger to medium-sized rhizomatous perennials, to filiform crescentiform or canaliculate in some of the smaller perennial or annual savanna species. Several neotropical forest species, not occurring in the study area, have relatively wide oblong-elliptic to oblong-lanceolate blades and pseudo-petioles, perhaps as an adaptation to more shaded habitats.

The inflorescence structure in *Rhynchospora* is rather diverse and can range from a single, solitary spikelet or capitate head of spikelets at the summit of the culm to large decompound panicles of many spikelets. These large panicles are often composed of a terminal and a series of 1 to several, lateral, remote or contiguous, simple to compound, corymbiform or cymose partial panicles from the upper, often sheathing, leaf-like bracts. Involucral bracts are leaf-like but often reduced in species with branching, paniculate inflorescences or they

can be highly reduced and nearly scale-like in unicapitate species, e.g., *R. globosa* which has several indurate, stiff and cartilaginous bracts surrounding the capitulum of spikelets. In *R.* section *Dichromena*, the capitulum is surrounded by a whorl of often well-developed, leaf-like bracts. Some species of section *Dichromena* have evolved white zones at the base of the bracts as an adaptation to insect pollination (Thomas 1984).

Spikelets of *Rhynchospora* consist of spirally imbricated scales with (1) 2 to several basal scales empty (sterile). The fertile scales are borne above these and each subtends a perfect flower, or often the terminal 1 or 2 scales are staminate only with abortive pistils. The floral morphology is generally uniform and characteristic of Cyperaceae in general. Flowers are typically wind pollinated or some capitate species have evolved white spikelet scales and zones at the base of the bracts as an adaptation to insect pollination. Each flower has (1) 2 or 3 stamens, each bearing a basifixed anther. The anther has parallel thecae which are longitudinally dehiscent at anthesis. The connective forms a short apiculus or lance-subulate appendage at apex which is often beset with minute papillae or protuberances. The base is truncate or lobed and also often is beset with minute papillae or protuberances. The single pistil encloses 2 connate carpels which have a single basally attached ovule and bears at its apex a single style that is 2-branched, shortly bifid, or undivided.

Hypogynous perianth bristles are present in many species. These bristles are particularly critical in that they are section-specific, i.e., bristle-bearing species and bristleless ones tend to fall together into tribal groups, e.g., species of *R.* section *Tenues*, which have close relationships in vegetative morphology, achene morphology, and achene micromorphology, all lack bristles. Bristles are generally finely antrorsely barbed with the exception of the temperate, North American-Eurasian, *R.* section *Albae* which are generally coarsely retrorsely barbed.

Achenes are biconvex or lenticular, often transversely rugose or rugulose. Sometimes they are somewhat smooth or reticulate, and always bear at their apex the persistent triangular, triangular-lanceolate or discoid, expanded style base. Achene shape in *Rhynchospora* is generally obovate to broadly obovate or elliptic-obovate. However, in some taxa they are rounded or nearly so. In *R. donselaarii* (Figs. 20 and 81 C-D), they are ovate or somewhat deltate. In this study, achene size could be as small as 0.6 mm diameter in *R. tenella* to 6 mm long in *R. trispicata* and 2.3 mm wide in *R. triflora*. Achenes are generally stramineous to light brown when immature and become brown, reddish brown, orangish brown, yellow brown, or sometimes blackish at maturity.

ACHENE MICROMORPHOLOGY

Achene epidermal cells of *Rhynchospora* are six-sided and are often rectangular or linear and either vertically or horizontally oriented, or less often they are isodiametric. Cell size in this study ranged from (10-) 20-40 (-50) µm in diameter for isodiametric cells and (30-) 40-200 × (10-) 20-50 µm for rectangular or linear cells. Generally the cells are composed of a central cone-shaped silica body (nodule) which grows centripetally in the cell, arising as a thickening on the inner periclinal wall (Ragonese et al. 1984). When these are developing, they may push out the exocarp and give the achene surface a minutely papillate texture or they may be less developed and scarcely pronounced, or not evident at all. In rugose achenes, the central nodules often form the crest of the rugae which can be quite pronounced in some species and scarcely evident in others. Buttresses are often present on the silica body (central nodule) that radiate out to the cell walls. Generally, anticlinal cell walls are in a distinctly sinuous (wavy) configuration at maturity or sometimes they are essentially straight. The periclinal cell wall, which is the outer surface of the cell, is generally flat or slightly convex. However, achenes in section *Cephalotae* typically have slightly concave walls. In section *Spermodontes* and some species of section *Tenues*, bullate cells (cells with strongly convex swollen periclinal walls) form along the margins and at the base.

Micromorphological studies of achene epidermal features in the Cyperaceae have been found to be useful taxonomically, particularly for delimitating taxa at the specific and varietal levels (Schuyler 1971a, 1971b; Toivonen and Timonen 1976; Denton 1983; Standley 1985, 1987; Wujek and Menapace 1986). However, studies applying this method to delimitate species at the sectional or generic level have produced mixed results. Schuyler (1971a, 1971b) found that both achene

features and overall morphology in *Scirpus* sensu stricto and *Eriophorum* were generally concordant, while in other natural groups, e.g., *Schoenoplectus*, the epidermal cell structure was diverse, although the overall morphology of plants within this group was generally uniform. A number of studies of species in large complex groups in *Carex* have found that there is a large diversity of epidermal cell structure within a well-defined section itself, and that this diversity was often as great as that between different sections (Menapace and Wujek 1985; Rettig 1986; Waterway 1990). However, Starr and Ford (2000), looking at achene epidermal silica bodies in a group of well studied and closely related species of *Carex* section *Phyllostachys* (J. Carey) L.H. Bailey, found that the differences in silica body features between taxa were consistent with previous phylogenetic analyses based on morphological, DNA sequence, and isozyme data. Their findings suggest that within clearly defined groups of closely related species, silica body characters can be good indicators of relationship.

The use of scanning electron microscopy of *Rhynchospora* achenes in this study was done for both illustrative purposes and to aid in the delimitation of species at the specific or varietal levels. Although this study does not go as far as looking at achene epidermal silica bodies, from the micrographs produced in this study, a preliminary evaluation based on epidermal cell structure can be made of relationships between species. These results can be compared to past and current monograph and sectional treatments of *Rhynchospora.*

CYTOLOGY

Only in recent years has any cytogenetic work been done in *Rhynchospora*. Like many other Cyperaceae, *Rhynchospora* exhibits holocentric chromosomes in which the centromeres are not localized at a single point on the chromosome body, but are distributed diffusely over its entire length. This allows for many points of spindle fiber attachment during meiosis and mitosis. Although the cytogenetics of the entire family is not known, the largest genus in the Cyperaceae, *Carex,* is known to exhibit holocentric chromosomes. This suggests that the presence of these in a large number and variety of sedges may be a synapomorphic feature in the family (Greilhuber 1995). Low frequencies of dysploidy and frequent variation in chromosome number, indicates that polyploidy was likely the predominant event in the karyotype evolution of the genus (Hoshino 1987; Vanzela et al. 2000; Guerra et al. 2000). Below is a table listing the species of *Rhynchospora* from the Guianas and published chromosome counts known for each.

Table 1: Chromosome Counts of *Rhynchospora* Species in the Guianas

Taxon	No.	Reference
Section *Cephalotae* Kük.		
R. albomarginata	—	
R. cephalotes	2n = 17, 18, 19	Luceño et al. 1998b
	2n = 18	Vanzela et al. 2000
R. comata	2n = 18	Vanzela et al. 2000
R. pubisquama	—	
Section *Chapmaniae* Gale		
R. brachychaeta	—	
Section *Dichromena* (Michx.) Vahl		
R. albescens	2n = 20 (ca.)	Thomas 1984
R. ciliata	2n = 10	Luceño et al. 1998a
R. montana	—	
R. nervosa	2n = 20, 30	Luceño et al. 1998a
	2n = 20	Shibata 1962

Taxon	No.	Reference
R. papillosa	—	
R. pubera subsp. *parvula*	—	
R. pubera subsp. pubera	2n = 10	Luceño et al. 1998a
R. radicans subsp. microcephala	—	
R. reptans	n = 20 (ca.)	Thomas 1984
R. steyermarkii	n = 10 (ca.)	Thomas 1984
R. watsonii	—	
Section *Fuscae* C. B. Clarke		
R. harperi	—	
Section *Glaucae* C. B. Clarke		
R. brasiliensis	2n = ca. 36	Vanzela et al. 2000
R. marisculus	2n = 30	Dopchiz et al. 2000
	2n = 36	Vanzela et al. 2000
R. rugosa	2n = 36	Vanzela et al. 2000
R. tepuiana	—	
Section *Longirostres* Kunth		
R. amazonica subsp. amazonica	—	
R. amazonica subsp. guianensis	—	
R. corymbosa	2n = 18	Nijalingapa et al. 1978
	2n = 18	Baquar 1978
	2n = 18	Luceño et al. 1998a
R. gigantea	2n = 18	Luceño et al. 1998a
R. triflora	2n = 18	Luceño et al. 1998a
R. trispicata	—	
Section *Paniculate* Boeck.		
R. angustipaniculata	—	
R. immensa	—	
R. polyphylla	—	
R. tuerckheimii	—	
Section *Pauciflorae* Kük.		
R. armerioides	2n = 10	Luceño et al. 1998a
R. barbata	2n = 10	Vanzela & Guerro 2000
	2n = 10	Vanzela et al. 2000
R. curvula	—	
R. dentinux	—	
R. subplumosa	—	
R. trichochaeta	—	
Section *Puriflorae* Kük.		
R. globosa	2n = 10	Luceño et al. 1998a
	2n = 36	Vanzela & Guerro 2000
Section *Polycephalae* C. B. Clarke		
R. exaltata	2n = 10, 20	Luceño et al. 1998a
R. hassleri	—	
R. holoschoenoides	2n = 10, 20	Luceño et al. 1998a
R. splendens	—	
Section *Proliferae* Kük.		
R. schomburgkiana	—	

Taxon	No.	Reference
Section *Pseudoaureae* C. B. Clarke		
R. bakhuisensis		
Section *Pseudocapitatae* C. B. Clarke		
R. arenicola	—	
R. maguireana		
R. pilosa	2n = ca. 50	Vanzela et al. 2000
R. subdicephala	—	
Section *Psilocarya* (Torr.) C. B.Clarke		
R. cajennensis	—	
R. candida		
R. divaricata	—	
R. nitens	—	
R. rupicola		
R. sublanata	—	
R. velutina	2n = 10	Vanzela et al. 2000
Section *Rhynchospora*		
R. fascicularis	—	
Section *Rigidifoliae* W.W. Thomas		
R. capillifolia		
R. longibracteata		
Section *Spermodontes* Kük.		
R. brevirostris	2n = 10	Vanzela et al. 2000
R. donselaarii	—	
R. fallax	—	
R. filiformis	2n = 10	Vanzela et al. 2000
R. tenerrima	2n = 20	Vanzela et al. 2000
Section *Stipitatae* M. T. Strong		
R. ayangannensis		
R. bolivarana		
Section *Tenues* Kük.		
R. albida		
R. caracasana	—	
R. contracta	2n = 18	Vanzela et al. 2000
R. cordatachenia	—	
R. emaciata	2n = 10	Vanzela et al. 2000
R. hirsuta	—	
R. junciformis	—	
R. riparia	2n = 10	Vanzela & Guerro 2000
	2n = 10	Vanzela et al. 2000
R. roraimae	—	
R. sanariapensis	—	
R. saxisavannicola	—	
R. spruceana	2n = 13	Gadela and Kliphuis 1964
R. tenella		
R. tenuis subsp. *austrobrasiliensis*	—	

Taxon	No.	Reference
R. tenuis subsp. *tenuis*	2n = 10	Gadela and Kliphuis 1964
	2n = 4	Vanzela et al. 1996
	2n = 8	Vanzela et al. 1996
	n = 10	Rath and Patnaik 1978
	2n = 10	Vanzela et al. 2000

INFRAGENERIC CLASSIFICATION

Rhynchospora, described by Vahl (1805), was first classified by Nees in the tribe *Rhynchosporeae* Nees in Wight & Arn. (Wight 1834). In Martius' Flora Brasiliensis, Nees (1842) segregated his tribe into three subtribes (*Haloschoeni, Haplostyleae*, and *Fissistylae*) and fourteen genera, many of which he newly described. Böckeler (1872) treated twenty genera in *Rhynchosporeae*. However, he synonymized many of Nees' genera to *Rhynchospora* and added other genera to the *Rhynchosporae* that had been previously treated in the tribe *Cladieae* Nees ex Fenzl by Nees and others. Bentham & Hooker (1883), also recognizing twenty genera, generally followed Böckeler's concept of the tribe, but added several genera (*Actinoschoenus* Benth., *Reedia* F. Muell., *Remirea* Aubl., and *Tricostularia* Nees ex Lehm.), excluded several others (*Cyathocoma* Nees and *Neesenbeckia* Levyns), and placed into synonymy *Ecklonia* Schrad. and *Chaetospora* R. Br. More recent classifications of the Cyperaceae (Goetghebeur, 1986; Bruhl, 1995), like Böckeler, have placed many of Nees' genera in the synonymy of *Rhynchospora*. However, many of the genera included by Böckeler and Bentham & Hooker in the *Rhynchosporeae* were moved to the tribe *Schoeneae* Dumort., which includes *Cladieae* and a large number of genera primarily restricted to the eastern hemisphere (South Africa, Asia, Australia, and the Pacific region). Currently, *Rhynchospora* is included in the *Schoeneae* as well (Goetghebeur 1998).

The first attempt at an infrageneric classification of *Rhynchospora* was made by Kunth (1837). He proposed three sections: *Capitatae, Longirostres*, and *Communes*. The *Capitatae* included species with head-like inflorescences, 3- to 9-flowered spikelets, and a bi-lobed style tip. The *Longirostres* included species with corymbose inflorescences, 2- to 7-flowered spikelets, 2-branched style, and well-developed elongate style base (beak). The *Communes* were circumscribed as those species having terminal and lateral fasciculate or corymbose inflorescences, 1- to 5-flowered spikelets, and a 2-branched style. These sections were somewhat artificial, being that they were circumscribed irregardless of other floral characteristics, particularly achene characters which are today, in most cases, the primary character used in species delimitation. Böckeler (1872) recognized four sections in *Rhynchospora*, two of which he newly described: *Corymbosae* Boeck., *Paniculatae* Boeck., *Capitatae* Kunth, and an unnamed section ("*rostrum fructus elongatum...*") that was equivalent to *R.* section *Longirostres* Kunth. Bentham & Hooker (1883) separated the genus *Rhynchospora* into two informal sections (as series), *Haplostyleae* and *Diplostyleae* [as *Dichostyleae*]. *R.* series *Haplostyleae* (Nees) Benth. & Hook. was based essentially on Nees subtribes *Haplostyleae* and *Fissistylae*. *Rhynchospora* series *Diplostyleae* Benth. & Hook. was based on Nees' subtribe *Haloschoeni*. Species segregated to *R.* section *Haplostylae* had entire or merely bilobed style tips while those segregated to *R.* series *Diplostyleae* had a distinctly 2-branched style. This division of the genus into two informal sections was subsequently followed by Clarke (1908), but these two series were later treated as subgenera by Kükenthal (1949; 1950; 1951) in his monograph of the genus worldwide. Clarke circumscribed seven sections in the *R.* subgenus *Haplostyleae* and four sections in *R.* subgenus *Diplostyleae*, while Kükenthal recognized two divisions (pars) and seven sections in *R.* subgenus *Haplostyleae* and three divisions (pars) and twenty-one sections in *R.* subgenus *Diplostyleae*.

No revision of the infrageneric classification of *Rhynchospora* has been attempted since Kükenthal and much of his concepts of the genus are still being followed. However, the general

opinion among cyperologists at present is that the two subgenera in *Rhynchospora* are artificial and a full phylogenetic study of the genus is needed. Some sectional treatments have been done (Gale 1944; Guaglianone 1979, 2001; Thomas 1984; Moore 1997) and several new sections have been described (Gomez-Laurito 1982; Thomas 1996).

The eighty taxa (including infraspecific taxa) of *Rhynchospora* in the Guianas fall into nineteen sections, one of which is newly described in this work (Table 2).

Table 2. List of *Rhynchospora* treated in this study and their assignment to section and according to Kükenthal (1949; 1950; 1951).

Taxon	This study	Kükenthal
R. albomarginata	*Cephalotae*	*Cephalotae*
R. cephalotes	*Cephalotae*	*Cephalotae*
R. comata	*Cephalotae*	*Cephalotae*
R. pubisquama	*Cephalotae*	—
R. brachychaeta	*Chapmaniae*	*Chapmaniae*
R. albescens	*Dichromena*	*Dichromena*
R. ciliata	*Dichromena*	*Dichromena*
R. montana	*Dichromena*	*Dichromena*
R. nervosa	*Dichromena*	*Dichromena*
R. papillosa	*Dichromena*	*Dichromena*
R. pubera subsp. parvula	*Dichromena*	*Dichromena*
R. pubera subsp. pubera	*Dichromena*	*Dichromena*
R. radicans subsp. microcephala	*Dichromena*	*Dichromena*
R. reptans	*Dichromena*	*Dichromena*
R. steyermarkii	*Dichromena*	*Dichromena*
R. watsonii	*Dichromena*	*Dichromena*
R. harperi	*Fuscae*	*Fuscae*
R. brasiliensis	*Glaucae*	—
R. marisculus	*Glaucae*	*Marisculae*
R. rugosa	*Glaucae*	*Stenophyllae*
R. tepuiana	*Glaucae*	*Stenophyllae*
R. amazonica subsp. amazonica	*Longirostres*	*Longirostres*
R. amazonica subsp. guianensis	*Longirostres*	*Longirostres*
R. corymbosa	*Longirostres*	*Longirostres*
R. gigantea	*Longirostres*	*Longirostres*
R. triflora	*Longirostres*	*Longirostres*
R. trispicata	*Longirostres*	*Longirostres*
R. angustipaniculata	*Paniculate*	—
R. immensa	*Paniculate*	*Paniculate*
R. polyphylla	*Paniculate*	*Paniculate*
R. tuerckheimii	*Paniculate*	*Paniculate*
R. armerioides	*Pauciflorae*	*Pluriflorae*
R. barbata	*Pauciflorae*	*Pauciflorae*
R. curvula	*Pauciflorae*	*Pauciflorae*
R. dentinux	*Pauciflorae*	*Pauciflorae*
R. subplumosa	*Pauciflorae*	*Pauciflorae*
R. trichochaeta	*Pauciflorae*	*Pauciflorae*
R. globosa	*Pluriflorae*	*Pluriflorae*
R. exaltata	*Polycephalae*	*Polycephalae*
R. hassleri	*Polycephalae*	*Polycephalae*
R. holoschoenoides	*Polycephalae*	*Polycephalae*
R. splendens	*Polycephalae*	*Polycephalae*

Taxon	This study	Kükenthal
R. schomburgkiana	*Proliferae*	*Proliferae*
R. bakhuisensis	*Pseudoaureae*	—
R. arenicola	*Pseudocapitatae*	*Pseudocapitatae*
R. maguireana	*Pseudocapitatae*	—
R. pilosa	*Pseudocapitatae*	*Pseudocapitatae*
R. subdicephala	*Pseudocapitatae*	—
R. cajennensis	*Psilocarya*	—
R. candida	*Psilocarya*	*Eu-Psilocarya*
R. divaricata	*Psilocarya*	*Eu-Psilocarya*
R. nitens	*Psilocarya*	*Eu-Psilocarya*
R. rupicola	*Psilocarya*	—
R. sublanata	*Psilocarya*	—
R. velutina	*Psilocarya*	*Eu-Psilocarya*
R. fascicularis	*Rhynchospora*	*Rhynchospora*
R. capillifolia	*Rigidifoliae*	—
R. longibracteata	*Rigidifoliae*	*Longibracteatae*
R. brevirostris	*Spermodontes*	*Spermodontes*
R. donselaarii	*Spermodontes*	—
R. fallax	*Spermodontes*	*Spermodontes*
R. filiformis	*Spermodontes*	*Spermodontes*
R. tenerrima	*Spermodontes*	*Spermodontes*
R. ayangannensis	*Stipitatae*	—
R. bolivarana	*Stipitatae*	—
R. albida	*Tenues*	*Pseudocapitatae*
R. caracasana	*Tenues*	*Pseudocapitatae*
R. contracta	*Tenues*	*Tenues*
R. cordatachenia	*Tenues*	—
R. emaciata	*Tenues*	*Tenues*
R. hirsuta	*Tenues*	*Tenues*
R. junciformis	*Tenues*	*Tenues*
R. riparia	*Tenues*	*Tenues*
R. roraimae	*Tenues*	*Laevinuces*
R. sanariapensis	*Tenues*	—
R. saxisavannicola	*Tenues*	—
R. spruceana	*Tenues*	*Spermodontes*
R. tenella	*Tenues*	*Tenues*
R. tenuis subsp. austrobrasiliensis	*Tenues*	—
R. tenuis subsp. tenuis	*Tenues*	*Tenues*

The sectional placement of each species was evaluated based on micromorphological achene characters and other floral characteristics allying species used both historically and discovered in this work. Only one species occurs for each of several sections represented in the Guianas (Table 2). *Rhynchospora* section *Fuscae* C. B. Clarke, well circumscribed by Gale (1944) and Kral (1996), is centered primarily in the southeastern United States and represented only by *R. harperi* (Fig. 67C,D), a species described from Georgia, U.S.A. There are several records of this plant from white sand coastal savannas south of Georgetown, Guyana and one east of Paramaribo, Suriname, representing a significant disjunction from its center of distribution in sandy pineland savannas of Georgia and Florida. *Rhynchospora brachychaeta* (Fig. 68C, D), in *R.* section *Chapmaniae* Gale, occurs from one locality in the Cuyuni-Mazaruni Region of northwest Guyana near the Venezuela border. Its center of distribution is in the West Indies. A single species, *R. fascicularis* (Fig. 68A, B), of the nominate section *Rhynchospora*, occurs in the Guianas. Its center of distribution is also in the southeastern United States but it ranges south through the Greater Antilles (Cuba and Puerto

Rico) Mexico, and Central America (Honduras and Nicaragua). It is at the southernmost part of its range in northern South America (Guyana and Suriname).

For neotropical species, where there are several or more taxa treated in this study for a particular section, some conclusions can be made bearing on the delimitation of sections circumscribed by Kükenthal (1949, 1950, & 1951) and others. Several characteristics support the circumscription of *R.* section *Cephalotae* Kük. Achenes of species in that section can be characterized as having isodiametric epidermal cells which form a low reticulation, no central nodules evident, thickened wire-like achene margins, lanceolate style base, and elongate setiform bristles which exceed the achene (Figs. 60-61). Species allied in this section also have the fertile spikelet scales completely covered by the outer subcoriaceous sterile scales and spikelets are frequently infested by insects and form galls. *Rhynchospora bakuisensis* (Figs. 8 and 62A-B), a new species, and the closely related *R. paraensis*, circumscribed by C. B. Clarke in his *R.* section *Pseudoaureae*, show achene characteristics of this section and perhaps are better placed there. However, species of *R.* section *Pseudoaureae* typically have large decompound inflorescences composed of 4 or 5 or more partial, lateral, open, branching panicles while species of *R.* section *Cephalotae* typically have only a single head-like or contracted panicle at the apex of the culm.

Rhynchospora section *Dichromena* (Michx.) Vahl was well circumscribed by Thomas (1984). Eleven taxa (including infraspecific taxa) occur in the Guianas (Figs. 74-77). This group has unicapitate inflorescences surrounded by a whorl of elongate, leaf-like involucral bracts. In some species, the involucral bracts are whitened basally and/or spikelet scales are white or whitish stramineous. Entomophily has been observed in some species which is rare in the Cyperaceae. The achenes lack bristles at the base and support a triangular-lunate style base at their apex. However, the achene epidermal cells are somewhat diverse. Most have vertically oriented rectangular cells which form a rugulose surface, while several others have isodiametric cells with well-developed central nodules and buttresses that give the achene surface a coarsely and deeply papillate texture. All cells, however, consistently have wavy walls which form a low reticulation above the surface.

Species of *R.* section *Glaucae* C. B. Clarke can be characterized as possessing achenes with linear, vertically oriented epidermal cells which form acutely to acuminately peaked rugae giving the achene a transversely rugulose surface (Figs. 66-67A,B). The style bases are flattened, triangular to triangular-lanceolate and the bristles are generally well-developed with trichomes basally. The bristles surpass the achene and often the style base. There seems to be little justification for maintaining *R.* section *Marisculae* Kük. which Guaglianone (1979) determined was heterogeneous. The type species, *R. marisculus* (Fig. 66C-D), has clear affinities to other species in *R.* section *Glaucae* including vegetative, spikelet, floral, achene and style base morphology, perianth bristles, and epidermal features (see Koyama 1972). Another species found in the Guianas, *R. brasiliensis* (Fig. 66A-B), a species Kükenthal did not see, also shows affinities to this section and warrants justification for including it therein as well.

In *Rhynchospora* section *Longirostres* Kunth, epidermal cells are generally isodiametric with a well-developed central nodule (silica body) giving the achene a minutely punctate surface (Figs. 56C-D, 57C-D, 58 and 59). This section has well-developed bristles which often greatly exceed the achene, and an elongate linear style base with a medial groove. However, there are several species placed in *R.* section *Longirostres* that have exceptions to this characterization. *Rhynchospora triflora* (Fig. 56C-D) has vertically oriented rectangular cells and rugose achene surface and *R. gigantea* and *R. corymbosa* (Fig. 59) have enlarged spongy-thickened triangular style bases and the margins of the achene are thickened with constrictions and protuberances. All the species, however, have medial grooves on the style base and the terminal scales (hidden by the fertile) are soft and membranous, wrinkled and puckered. They are further supported as a natural group by exhibiting C_3 photosynthesis (Ueno & Koyama 1987) and having a consistent 2n=18 chromosome number (Moore 1997; Luceno et al. 1998; Vanzela et al. 2000; and Dopchiz et al. 2000). Ecologically, throughout their range, many of the species are restricted to coastal plain habitats. This is evident for several of the species occurring in the Guianas, e.g., see range maps for *R. corymbosa, R. gigantea, R. triflora* and *R. trispicata* (Figs. 17, 24, 49, and 50 respectively).

The arrangement of achene epidermal cells in *R.* section *Paniculatae* Boeck. is unique among other species of *Rhynchospora* in that the rectangular cells are arranged horizontally to the main axis giving the achene a cancellate surface (Figs. 63C-D, 64, 65). The unbranched or only slightly bilobed styles and often diffusely branching paniculate inflorescences also characterize this group. Achene bristles are present in this group but they are often short or sometimes rudimentary. Often on the same plant, there will be achenes with at least several well-developed bristles, while on other achenes they may be rudimentary. Although this group is well defined, the polymorphic nature of the inflorescences and achene morphology make it very difficult to draw species limits.

The species of *R.* section *Pauciflorae* Kük. are well defined on the bases of achene micromorpology and inflorescence. Achene epidermal cells are isodiametric with a well-developed central nodule giving the achenes a minutely papillate or puncticulate surface. Papillae, tubercles, or large warty or barb-like projections or processes are often present in the epidermis (Figs. 52-55A-B). Bristles are well-developed and plumose (at least basally), and they exceed the achene and often the style base as well. Some species have achenes with inrolled margins which are sinuate-corrugate or in one species winged. The inflorescences are unicapitate and subtended by an imbricate series of scale-like involucral bracts.

One species of *Rhynchospora* section *Pluriflorae* Kük., *R. globosa*, is represented in the Guianas. Kükenthal (1949) characterized this section as differing from the closely related *R.* section *Pauciflorae* by solitary, ridgid bulbous-based culms (vs. caespitose, slender and somewhat bulbous-based culms), ridgid leaves (vs. herbaceous leaves), and 4- to 9-flowered spikelets (vs. 1- to 3 (-4)-flowered spikelets). One species he assigned to this section, *R. armerioides*, has all the characteristics he assigned to *R.* section *Pauciflorae* and the achenes have epidermal features characteristic of that section as well. It is here placed in *R.* section *Pauciflorae* based on this. Recent studies of *R.* section *Pluriflorae* (Araujo 2001, 2003) indicate that it is paraphyletic. Araujo (2001) recircumscribed Kükenthal's subsection *Subebracteatae*, including *R. globosa*, *R. exilis* Boeck., *R. loefgrenii* Boeck. and three newly described taxa within it, excluding two taxa, *R. armerioides* and *R. hirta* (Nees) Boeck., that Kükenthal applied to it and indicated that this subsection is now monophyletic.

Bearing on the results of this study, Kükenthal's emended circumscription of C. B. Clarke's *R.* section *Polycephalae* is heterogeneous. The species in this section are not well supported as a group by achene epidermal features. They were primarily characterized by Kükenthal as having inflorescence panicles bearing capitula (heads or clusters) of spikelets and achenes lacking bristles. Two of the species occurring in the Guianas, *Rhynchospora exaltata* and *R. splendens* (Figs. 70A-B and 69C-D), have achenes that can be characterized as having a linear-falcate style base, vertically-oriented linear cells, longitudinal wrinkle-lines, and lacking bristles. However, Kükenthal (1950) included two other species in this section, *R. hassleri* and *R. holoschoenoides* (Figs. 57A-B and 56A-B), that have well-developed bristles. Both of these taxa are perhaps better placed in *R.* section *Longirostres* based on their achene features (including well-developed bristles), style base morphology, and spikelet scale morphology. However, it has been determined that *R. holoschoenoides* has a diploid chromosome number of 10 and 20 (Luceño et al. 1998a) which is inconsistent with the diploid number 18 known typically for species in *R.* section *Longirostres*. The spikelet and achene features of *R. hassleri* undoubtedly ally it to *R.* section *Longirostres*, but no chromosome number has yet been determined for it. Both of these species are here retained in the heterogeneous *R.* section *Polycephalae* pending further study of species in that section.

In this study, the species of *Rhynchospora* section *Pseudocapitatae* C. B. Clarke are heterogeneous. Two of these species (*R. albida* and *R. caracasana*), circumscribed by Kükenthal (1950) in this section, appear to be better placed in *R.* section *Tenues*. The inflorescences of these two species are lax corymbs of fascicled spikelets. The achene epidermal cells are vertically oriented linear or rectangular cells. The style base is triangular or depressed-triangular and not articulate with the achene apex. All are characteristics of *R.* section *Tenues*. Species of *R.* section *Pseudocapitatae* can be characterized as having pilose leaf blades and involucral bracts. The inflorescence consists of capitate heads of spikelets borne laterally on peduncles from leaf-like bracts or singly at the apex of the culm. Spikelet scales

have scabrous-hispid awns with coarse tubercle-based trichomes on the midcosta and awns. The achenes often have two lateral pits at base and lack bristles. The style base is depressed-discoid or conical and articulates with the achene apex (Figs. 72-73).

Kükenthal (1950) placed *Rhynchospora schomburgkiana* (syn: *R. prolifera* C. B. Clarke, *nom. illeg.*) into its own section, *R.* section *Proliferae* Kük. The habit of this plant is unique among *Rhynchospora*. Its cymose inflorescence is much like a *Bulbostylis* or *Fimbristylis* and it spikelets are often proliferous. The achene epidermal cells are isodiametric with central nodules and are about 10 µm in diameter, at least twice as small as isodiametric cells of other species observed in this study. The narrowly ellipsoid achene with its thickened apex and short-conic style base which is subconfluent with the achene apex, is not characteristic of any other American species of *Rhynchospora* (Fig. 70C-D).

In the Guianas, seven taxa of *R.* section *Psilocarya* (Torr.) C. B. Clarke are represented. This section is characterized by its combination of a transversely rugulose achene surface; lack of bristles; vertically oriented rectangular epidermal cells with well-developed central nodules that form rugae (ridge lines) transversely across the achene surface; and the 5- to many-flowered (-fruited) spikelets (Figs. 78-80A, B). Most other *Rhynchospora* have only 1-3 perfect flowers which mature as many fruits per spikelet. Some authors have treated this group at the rank of genus (*Psilocarya*) based primarily on the many-flowered spikelets.

Two species, *R. capillifolia* and *R. longibracteata*, attributed to the recently described *R.* section *Rigidifoliae* W.W. Thomas (Thomas 1996) occur in the Guianas. The achene epidermal cells of these two taxa have vertically oriented rectangular cells that form a shallow reticulation. The achene surface appears essentially smooth at low magnification. Both style bases are similar in that they are strap-like and not well differentiated from the apex of the achene (Fig. 71). Other characters allying these two species and characteristic of the section are the unicapitate inflorescences, linear-subulate spongy-thickened leaf blades, and lack of bristles.

Results from this study indicate that *R.* section *Spermodontes* Kük., as originally circumscribed, is heterogeneous. Typically, species of this section are unique in *Rhynchospora* in that the summit of the achene body forms a rim around the style base. The two lateral margins of the achene are generally prolonged and cusp-like at their apices (Figs. 80C-D, 81, 82). In some species, the surface of the achene is essentially plane and smooth, as seen at low magnification, but as seen with SEM, cells are slightly convex forming a cobblestone-like surface with cell walls not evident or sometimes distinct and slightly raised above the surface. Some cells on an achene are somewhat oblong and appear vertically oriented, while others appear isodiametric. The base and/or margins of the achenes have bullate cells. These are particularly developed in *R. filiformis* (Fig. 80C-D). Other species circumscribed in this section have transversely rugulose achene surfaces characteristic of *R.* section *Tenues* (Fig. 82). Typically, the style base is low and often obtusely triangular, sometimes decurrent on the upturned cusp-like margins of the achene apex. One species, *R. spruceana* (Fig. 86A-B), lacks the prolonged, cusp-like tips of the achene margins, and has a transversely rugulose achene surface, style base, and spikelet scales characteristic of *R.* section *Tenues*. In light of these features, it is here transferred to that section. Two closely related species of this section, treated in this study, *R. fallax* and *R. tenerrima* (Fig. 82), have cusp-like achene margins typical of the section, but have transversely rugulose achene surfaces characteristic of *R.* section *Tenues*.

In the Guianas, *R.* section *Tenues* Kük. has the largest representation of species with 14 specific and infraspecific taxa (Figs. 83-88). Thomas (1998) treated 16 taxa (including several unknowns) for the Venezuelan highland region of South America and eleven taxa were treated (including two newly described) by Rocha & Luceño (2002) in a treatment of *R.* section *Tenues* for Brazil. These are low annuals or perennials, less than 0.5 m tall, primarily of sandy savanna and grassland habitats. This is a well-characterized section having a transversely rugulose achene surface, vertically oriented linear cells that have finely sinuous walls, 2-lobed style base, and bristles wanting. Some species have bullate cells at the base characteristic of *R.* section *Spermodontes*. As discussed previously, two species of that section (*R. fallax* and *R. tenerrima*) have characteristics of *R.* section

Tenues. They have the linear, vertically oriented epidermal cells and transversely rugulose surface typical of that section. Style bases of *R.* section *Tenues* are generally 2-lobed at base with lobes that extend along the shoulders of the achene apex. However, in some species the lobes are indistinct, e.g., *R. spruceana* and *R. albida* (Fig. 86) or unlobed altogether as in e.g., *R. caracasana, R. hirsuta*, and *R. tenella* (Figs. 83C-D; 87C-D; and 85A-B respectively).

The glossy and transversely rugulose achene surface of species of *R.* section *Tenues* and other *Rhynchospora* species may help protect the embryo and surrounding tissue from lethal temperatures brought by full sunlight in open habitats like savanna and grassland. Like lighter surfaces of objects which reflect sunlight and are internally cooler, glossy epicuticular waxes on the achene surface increase reflection of incoming radiation and aid in regulating internal temperature (Eller 1979). The surface sculpturing of a seed increases its surface area up to ten times. The surface irregularity may increase energy exchange with the surrounding cooler air and may increase thermodynamic exchange by causing turbulence in laminar air flow around the seed surface (Barthlott 1981).

Two of the taxa treated in this study, *Rhynchospora bolivarana* and *R. ayangannensis*, are here placed in a new section, *R.* section *Stipitatae* M. T. Strong. The new section is formally described and compared with another allied section as follows:

Rhynchospora section **Stipitatae** M. T. Strong, sect. nov. Type: *Rhynchospora ayangannensis* M. T. Strong, Novon 11: 263. 2001. (Figs. 7, 10, 11, 62C-D, 63A-B).

Perennes, rhizomatosae; inflorescentia paniculata; squamae 13-17, 9-12 fertiles, uniformiter brunneae pallidae vel stramineae, saepe leviter lineolatae; stylus profunde bifidus; achenia obpyriformia vel subturbinata, longa stipitata; setae 6, antrorse barbatae, achaenia superantes; styli basis anguste triangularis vel lanceolata.

The achene epidermal structure of the two species included in this section is similar to that of *R.* section *Cephalotae* in that they have a fine, low cellular-reticulate surface and no evident silica bodies (central nodules), but the cells are often irregular and less isodiametric, tending towards rectangular and longitudinally oriented (Figs. 62C-D, 63A-B). At maturity, the periclinal walls are convex, while those of *R.* section *Cephalotae* are concave. Other differences from *R.* section *Cephalotae* include the long slender stipitate base of the achenes (vs. estipitate) and herbaceous, dull, outer spikelet scales. Outer spikelet scales in *R.* section *Cephalotae* generally are thickened-herbaceous to somewhat coriaceous and semi-glossy. Both taxa in *R.* section *Stipitatae* are Guiana Shield endemics, *R. bolivarana* known only from Venezuela and Guyana and *R. ayangannensis* endemic to Guyana.

HABITAT AND DISTRIBUTION

Rhynchospora is a genus of approximately 270 species with its greatest diversity in the western hemisphere, particularly warm-temperate North America and the neotropics. There are few species outside of the Americas, several having pantropical distribution, e.g., *Rhynchospora corymbosa*, *R. holoschoenoides*, and *R. triflora*. Of the eastern hemisphere, tropical Africa has the most taxa with about fifteen, several of these, e.g., *Rhynchospora candida* and *R. triflora*, being found disjunct in tropical South America as well.

From this study, eighty taxa (including infraspecific taxa) are now known to occur in the Guianas. This represents 31% (approximately 1/3) of all *Rhynchospora* species. Sixty of the eighty species (75%) of *Rhynchospora* occurring in the Guianas, are found in some type of open or shrub savanna habitat. Savanna habitats in the Guianas are generally classified into four types, two occurring in lowland areas and two in the highlands. Lowland savannas are more common and most extensive in area, with lowland white-

sand savannas generally occurring on the coastal plain, while lowland shrub savannas occur primarily inland. In the highlands, small areas of both highland shrub and open savannas occur (Huber et al. 1995).

Figure 1 shows the principal habitats in the Guianas where *Rhynchospora* occur. Areas in dark green represent lowland savanna habitat. Of the three countries, Guyana has the largest areas of lowland savanna. Fairly extensive areas of white-sand savanna occur on the coastal plain southeast of the capital city of Georgetown in the Berbice Region and smaller areas of white-sand savanna occur in the vicinity of Linden along the southern border of the capital city. These are the western extent of a northern "savanna-belt" in the Guianas that extends from the coastal plain in French Guiana west-northwest through northern parts of Suriname and into northeastern Guyana, lying on sediments of tertiary to quaternary age. More extensive lowland savannas occur well inland in southwestern Guyana in the Rupununi Region northeast and southeast of Lethem on either side of the Kanuku Mountains, and smaller highland savanna habitats occur in uplands on sandstone remnants of the Roraima formation or on exposed parts of the Guianan shield in the western part of the country. Smaller upland savanna habitats in Guyana are represented in blue. Savannas in Suriname were surveyed by Cohen & Van der Eyk (1953) and their vegetation types characterized by Donselaar (1969). Savanna habitats in Suriname are similar to those in Guyana, but are not as extensive. Going from north to south, they include those on formations of the northern coastal plain and lowlands (part of the northern savanna-belt); those of the sandstone remnants of the Roraima formation, e.g., Tafelberg savanna; and in the south, those of the exposed parts of the very old Guiana shield (Sipaliwini-Paru savanna). In French Guiana, savanna habitat is primarily restricted to the coastal plain extending in a narrow band along the northern coast, forming the eastern extent of the Guianas northern savanna-belt.

Uplands (montane habitats) in the Guianas are represented in yellow. The largest area of upland habitats lie in northwest Guyana and are the eastern extent of the Guayana shield which is represented by smaller mountain ranges in central Suriname and French Guiana. The small polygons in northwestern Guyana, represented in blue and several in red, are the upland savanna habitats and flat-topped mountains (tepuis of Mt. Roraima, Mt. Ayanganna, and Mt. Wokumung) respectively. In French Guiana, small upland inselbergs are represented in purple. These are granite domes which often have what are termed "rock savanna" habitat, a barren of low scrub vegetation which supports open microhabitats for sedges, grasses, and other herbaceous plants. The light green area of the map generally represents tropical lowland forest habitat.

When looking at the distribution of *Rhynchospora* as a whole within the Guianas (Fig. 1), the predominance of data points (small triangles) appear clustered over areas of savanna and uplands in all three countries, reflecting the high concentration of species occurring in those habitats. However, the clustering of data points in certain areas may be due in part by relatively easy accessibility to some areas via river systems and roads or more plant collectors stationed in large urban areas making collections locally. The few data points in tropical lowland forest habitats (light green areas of map), e.g., riparian forest habitats or coastal plain swamps, primarily represent species of *Rhynchospora* sections *Dichromena* and *Longirostres* respectively. For example, the data points seen in northern Guyana are represented by species of both these sections. Those of *R.* section *Longirostres* occur towards the coast in swampy habitats, while those of *R.* section *Dichromena* further inland in riparian forest habitats.

As mentioned previously, *Rhynchospora* which are generally restricted to forested habitats include species of *R.* section *Dichromena* (*R. albescens, R. papillosa, R. reptans, R. steyermarkii,* and *R. watsonii*), which typically occur in wet, tropical lowland forest along blackwater creeks, streams, and rivers in habitats such as rocky creek beds, margins of creeks and streams, and waterfalls. Others occur in or are primarily restricted to lowland habitats such as seasonally flooded forest, riparian forest, swamps, marshy areas, and in canals. In particular are species of *R.* section *Longirostres,* which include *R. amazonica* subsp. *amazonica*, *R. corymbosa*, *R. gigantea, R. triflora,* and *R. trispicata*, several of which occur primarily on the coastal plain.

Species generally restricted to granitic substrate such as rock outcrops, inselbergs, and rock savannas include, *R. comata, R. dentinux*, *R. fallax, R. pubisquama, R. rupicola,* and *R.*

subdicephala. The four species of *R.* section *Paniculatae* in the Guianas (*R. angustipaniculata, R. immensa, R. polyphylla,* and *R. tuerckheimii*) are found only in openings of upper montane forest habitats on mountain summits in habitats such as rock outcrops and scrub. Other upland species restricted to upper montane habitats and tepui summits include *R. ayangannensis, R. bakuisensis, R. capillifolia, R. exaltata, R. pubisquama, R. roraimae, R. splendens,* and *R. tepuiana.*

There are a number of endemic *Rhynchospora* of note in the Guianas. There are three known from Suriname, *R. bakhuisensis, R. donselaarii,* and *R. montana.* One of these, *R. donselaarii* is from the Sipaliwini Savanna which is the northern tip of the extensive Sipaliwini-Paru savanna area that lies for the most part in the State of Pará, Brazil (see Fig. 1). It is likely, considering the large size this savanna area occupies in Brazil, that this species may very well be discovered there in the future. *Rhynchospora bakhuisensis* is only known from a high mountain summit in the Bakhuis Mountains in central Suriname while *R. montana*, a forest species of *R.* section *Dichromena*, occurs in east central Suriname in the Brownsberg Nature Reserve and Lely Mountains. There are two Guyana endemics, *R. angustipaniculata* and *R. ayangannensis*, both occurring in the Pakaraima Mountains on several of the higher summits with rocky granitic outcrops and flat-topped, tepui meadow habitats. French Guiana has a single endemic, another savanna species of *R.* section *Tenues*, *R. cordatachenia.* This plant is from the coastal savanna belt of northern French Guiana near Cayenne in the Savane du Gallion. Several species are endemic to the Guianas as a whole, *R. rupicola* and *R. sublanata* are known from both Suriname and Guyana, while *R. pubisquama* and *R. saxisavannicola* are known only from Suriname and French Guiana. Guayana shield endemics, here defined as those species which are found both on the Guayana shield of Venezuela and Guyana, include *R. bolivarana, R. cajennensis, R. capillifolia, R. maguireana, R. papillosa, R. roraimae,* and *R. tepuiana.* Few of the endemics are from lowland savanna or tropical forest habitats, the majority being from upland montane habitats and microhabitats such as forest openings, tepui meadows, granitic outcrops, granite inselbergs, and rock savanna. With the exclusion of the lowland species *R. cajennensis* and *R. papillosa*, the Guayana shield endemics listed previously and the Guyana endemics, *R. angustipaniculata* and *R. ayangannensis* are all found in upland habitats of the Pakaraima Mountains. These include the more or less flat-topped peaks (tepuis) of Ayanganna, Roraima, and Wokumung, on which many of the endemics occur.

TAXONOMIC TREATMENT

Rhynchospora Vahl

Rhynchospora Vahl, Enum. Pl. 2: 229. 1805 [as '*Rynchospora*'], *nom. et orth. conserv.* Type: *Rhynchospora alba* (L.) Vahl ≡ *Schoenus albus* L., Sp. Pl. 1: 44. 1753, *typ. conserv.*

Dichromena Michaux, Fl. Bor.-Amer. 1: 37. 19 Mar 1803, *nom. rej.* Type: *D. leucocephala* Michx. = *Rhynchospora colorata* (L.) H. Pfeiff.

Spermodon Palisot de Beauvois ex Lestiboudois, Essai Cyp. 27. 29 Mar 1819. Type: *S. setaceus* (P. J. Bergius) Nees ≡ *Rhynchospora setacea* Boeck., *nom. illeg.* = *Rhynchospora tenerrima* Nees ex Spreng.

Calyptrostylis C. G. D. Nees, Linnaea 9: 295. 22-28 Jun 1834. Type: *C. rudgei* Nees, *nom. illeg.* = *Rhynchospora gigantea* Link.

Mitrospora C. G. D. Nees, Linnaea 9: 295. 1834. Type: *M. polyphylla* (Vahl) Nees ≡ *Rhynchospora polyphylla* Vahl.

Cephaloschoenus C. G. D. Nees, Linnaea 9: 295. 22-28 Jun 1834. Type: *C. globosus* (Kunth) Nees ≡ *Rhynchospora globosa* (Kunth) Roem. & Schult.

Haloschoenus C. G. D. Nees, Linnaea 9: 296. 1834. Type: *H. capillaris* Nees = *Rhynchospora tenuis* Willd. ex Link.

Echinoschoenus C. G. D. Nees & F. J. F. Meyen in Nees, Linnaea 9: 297. 1834 (med.)-1835 (prim.). Type: *E. triceps* (Vahl) Nees & Meyen ≡ *Schoenus triceps* Vahl – *Rhynchospora holoschoenoides* (Rich.) Herter

Psilocarya J. Torrey, Ann. Lyceum Nat. Hist. New York 3: 359. 1836. Lectotype: *P. scirpoides* Torr. ≡ *Rhynchospora scirpoides* (Torr.) A. Gray

Leptoschoenus C. G. D. Nees, J. Bot. (Hooker) 2: 393. 1840. Type: *L. prolifer* Nees = *Rhynchospora schomburgkiana* (Boeck.) T. Koyama

Ephippiorhynchium C. G. D. Nees in C. F. P. Martius, Fl. Brasil. 2(1): 134. 1 Apr 1842. Type: *E. polycephalum* Nees ≡ *Rhynchospora polycephala* Kunth, *nom. illeg.* = *Rhynchospora holoschoenoides* (Rich.) Herter

[*Pachymitra* Nees, Fl. Brasil. 2(1): 115. 1842. Invalid name published as a synonym. Type: *P. velutina* Nees ≡ *Rhynchospora velutina* (Kunth) Boeck.].

Trichochaeta Steudel, Syn. Pl. Glum. 2: 155. 10-11 Apr 1855. Type: *T. tenuis* Steud. ≡ *Rhynchospora trichochaeta* C. B. Clarke

Synonyms cited above are only those occurring in the Guianas. For a full synonymy of *Rhynchospora* see Koyama (1972).

Perennials or sometimes annuals, vegetatively diverse; roots fibrous. Culms caespitose or borne singly, trigonous or obscurely so, occasionally cylindrical, shallowly to deeply channeled along one side or margin (at least distally) with channel edges often antrorsely scabrous, essentially smooth, sometimes scabrous distally, glabrous or sometimes hirsute. Leaves basal or basal and cauline, rarely strictly cauline; sheaths green, light brown or reddish brown, sometimes whitened at base, inner band membranous on basal sheaths, often purple-dotted, splitting with age, often membranous only at orifice on cauline sheaths, the orifice truncate or concave, sometimes U-shaped, rarely convex; ligule absent or sometimes present, often a narrow band of thickened tissue or trichomes at adaxial junction of sheath and leaf blade; blades flattened, V-shaped, or folded, occasionally involute or crescentform-capillary, linear, filiform, or sometimes capillary, herbaceous or occasionally stiff, glabrous, hirsute, or occasionally scabrous or scabridulous distally, rarely papillose or transversely rugulose, the margins and abaxial midvein usually antrorsely scabrous, ciliate, or with setose hairs. Inflorescence terminal or both terminal and with a series of lateral partial panicles from the upper leaf-like bracts, paniculate, corymbose, racemose or congested and head-like; involucral bracts in capitate species sometimes whitened at base; branches cylindrical, 3-angled, crescentform, or subcompressed, finely ribbed, scabrous, ciliate or smooth on margins, the spikelets solitary or in fascicles at branch tips; spikelets ovoid, ellipsoid, lanceoloid, or fusiform, cylindrical or subcompressed, primarily 1- to several-flowered, the scales spreading with maturing achenes; scales spirally imbricate, ovate to lanceolate, shallowly to deeply boat-shaped, often inrolled around flower, finely and indistinctly nerved on sides, with a single, slender, distinct or sometimes indistinct midcosta, light to dark brown or ferrugineous, sometimes white or whitish. Flowers bisexual above the (1-) 2-5 (-9) empty basal scales of spikelet, the terminal often staminate with a rudimentary ovary or reduced and empty; bristles (1-) 6 (-20), rudimentary, or absent, when present antrorsely or sometimes retrorsely barbed, sometimes smooth or plumose; stamens 1-3 (-12), the anthers linear, narrowly elliptic or oblong, often with minute crystalline papillae or lobes at base; styles subulate, 2-branched or undivided, often long-exserted beyond apex of subtending scale. Achene biconvex to subcylindrical, sometimes inrolled with winged or wavy margins, obovate, oblong-obovate or oblong-elliptic, deeply pitted, transversely rugulose or sometimes smooth, the expanded, usually triangular, or sometimes discoid style base, persistent at the summit.

Key to the species of **Rhynchospora** in the Guianas

1a. Inflorescence a single globose, ellipsoid, turbinate, or hemispherical head of spikelets (in some species reduced to 2-several spikelets and in one, unispiculate) at the summit of the culm, lateral branching not evident; involucral bracts subtending spikelets (3-) 4-8, leaf-like, often appearing whorled, uniformly green or sometimes whitened basally 2
1b. Inflorescence with some lateral branching evident, a single or series of fascicles or panicles of spikelets, terminal only or often a terminal and series of 1-7 lateral, remote to contiguous, headlike, congested, or open, small or large, simple to compound, pedunculate partial panicles from the upper leaf-like bracts; bracts subtending each panicle or partial panicle 1 (-2), uniformly green... 29

2a. Bristles absent or sometimes several rudimentary ones present as nubs or short vestiges 3
2b. Bristles present, well-developed, barbed or spinulose 19

3a. Achene surface essentially smooth; leaf blades involute, linear-subulate or spongy-thickened; spikelet scales white or whitish stramineous 4
3b. Achene surface transversely rugulose, puncticulate, papillose, tuberculate, or reticulate; leaf blades flattened, V-shaped, or plicate, linear, not subulate or spongy-thickened; spikelet scales whitish, whitish stramineous or light brown to reddish brown 5

4a. Culm 3-5 mm wide at base, hollow, easily compressed, with septate partitions (at least some present); achenes sometimes bearing 1 or 2 rudimentary bristles at base ..... 43 *R. longibracteata* Boeck.
4b. Culms 0.3-2 mm wide at base, firm, not easily compressed, without septate partitions; achenes lacking rudimentary bristles..... 18 *R. capillifolia* W. W. Thomas

5a. Spikelets (9-) 20-100 or more per head, light-brown to reddish brown, or stramineous when immature; style undivided or shortly bifid, the persistent base subdiscoid or conical, narrower than achene, often constricted or articulate at junction with achene body 6
5b. Spikelets 2-16 per head, whitish to stramineous or light brown; style deeply bifid, the persistent base triangular or lunate, as wide as apex of achene or nearly so proximally, not constricted at junction with achene body 8

6a. Spikelet head(s) globose, obloid, or very widely ovoid; spikelet scales all awned, the awns reddish brown to purplish black; style base broadly elliptic or subdiscoid; achenes obovate .... 67 *R. subdicephala* T. Koyama
6b. Spikelet head hemispherical, rarely subglobose; distal spikelet scales short-mucronate, the awns of proximal scales greenish brown to brown; style base conical or cap-shaped; achenes obpyriform 7

7a. Leaf blades herbaceous, the adaxial midvein glabrous; style base cap-shaped, sessile with achene apex; achene abruptly narrowed just below the middle, stipe-like to base .....50 *R. pilosa* (Kunth) Boeck.
7b. Leaf blades stiffened, subcoriaceous, the adaxial midvein hispid; style base subconical, articulate with achene apex; achene more gradually narrowed to base ..... 7 *R. arenicola* Uittien

8a. Involucral bracts subtending spikelets white adaxially, the white portion conspicuous and exceeding the inflorescence 9
8b. Involucral bracts subtending spikelets uniformly green or reduced and scale-like, or rarely with some white at base, the white portion not exceeding the inflorescence 12

9a. Plants stoloniferous and glabrous; achenes strongly papillose to occasionally papillose-rugulose; style base lunate; forested habitats, along rivers, creeks, and streams 10
9b. Plants rhizomatous, often pubescent; involucral bracts usually ciliate basally along margins and often hirsute abaxially; achenes transversely rugulose or indistinctly papillose; style base triangular; open sand savanna and ruderal or disturbed habitats 11

10a. Culms not winged; achene finely papillose; style base forming a thick brownish ridge extending down along margins of achene to about the middle ..... 56 *R. reptans* (Rich.) Kük.
10b. Culms narrowly winged (at least distally); achene coarsely papillose; style base forming a concave channel with flaring flange-like margins that are decurrent and contiguous along margins of achene body to base ..... 49 *R. papillosa* W. W. Thomas

11a. Rhizomes with elongate internodes; culms separate, usually longer than the leaves; basal leaves 1.1-2.6 mm wide, the blades seldom hirsute abaxially; restricted to sand savannas..... ..... 47 *R. nervosa* (Vahl) Boeck.
11b. Rhizomes with short internodes; culms caespitose, usually shorter than the leaves; basal leaves 1.5-4.5 mm wide, the blades commonly hirsute abaxially; growing in ruderal and disturbed habitats ..... 21 *R. ciliata* (G. Mey.) Kük.

12a. Plants stoloniferous 13
12b. Plants caespitose 15

13a. Culm narrowly winged (at least distally); involucral bracts well-developed, 10-30 (-40) mm long; achene strongly papillose ..... 49 *R. papillosa* W. W. Thomas
13b. Culms not winged; involucral bracts highly reduced, to 12 mm long; achene rugulose 14

14a. Spikelets 1; fertile scales 1.5-2 mm long; anthers 0.5-0.7 mm long; achene 0.7-0.9 mm long; style base very shallowly lunate ..... 1 *R. albescens* (Miq.) Kük.
14b. Spikelets (1-) 2-4 (-5); fertile scales 3-4 mm long; anthers 1.7-2.3 mm long; achene 1-1.1 mm long; style base depressed-triangular, 2-lobed (like a mustache) ..... 66 *R. steyermarkii* T. Koyama

15a. Style base 4-lobed, with 2 short lobes medially and 2 strap-like lobes on shoulders, these often with rounded or upturned ends 16
15b. Style base not 4-lobed nor with upturned ends 17

16a. Plants (4-) 6-45 (-50) cm tall; spikelets 5.5-8.5 mm long; achenes 1-1.5 mm wide, the surface with deep and coarse rugae ..... 53 *R. pubera* subsp. *pubera*
16b. Plants 4-31 cm tall; spikelets 3.5-5.3 mm long; achenes 0.7-1.2 mm wide, the surface with shallower and less coarse rugae than the preceeding ..... 52 *R. pubera* subsp. *parvula* W. W. Thomas

17a. Leaf blades 1.4-5 mm wide; involucral bracts 1.5-4.5 mm wide; spikelets 3-6, generally 3 in a palmate arrangement with the central one larger than the two lateral ones..... ..... 55 *R. radicans* subsp. *microcephala* (Bertero ex Spreng.) W. W. Thomas
17 b. Leaf blades 6-15 mm wide; involucral bracts 4-16 mm wide; spikelets 6-16, not palmately arranged 18

18a. Leaf blades and involucral bracts linear-lanceolate; involucral bracts (4-) 5-9 (-11), the lowermost one 8-32 cm long; spikelets 11-24 × 3-6 mm ..... 80 *R. watsonii* (Britton) Davidse
18b. Leaf blades and involucral bracts elliptic-lanceolate; involucral bracts 3-5, the lowermost one 3.5-9 cm long; spikelets 5-6.5 × 1-1.7 mm ..... 46 *R. montana* (Uittien) H. Pfeiff.

19a. Inflorescence a single ovoid, oblong-ovoid, pyramidal, or globose head-like panicle of many congested spikelets at the apex of the culm; style deeply 2-branched; achene surface reticulate or transversely rugulose-reticulate; bristles not plumose 20
19b. Inflorescence a globose, hemispherical, or turbinate head of sessile spikelets, or cluster of 1-several sessile spikelets at the apex of the culm; style simple (unbranched) or shortly bifid at apex; achene surface puncticulate or papillose, often with tubercles or large warty or barb-like projections or processes in the epidermis; bristles plumose, at least basally (except in *R. amazonica* subsp. *amazonica*) 22

20a. Inflorescence globose; achene body truncate at apex ..... 3 *R. albomarginata* Kük.
20b. Inflorescence ovoid, oblong-ovoid, pyramidal, or oblong, sometimes lobate at base; achene body rounded at apex 21

21a. Spikelet scales glabrous; inflorescence ovoid to oblong-ovoid, pyramidal or subglobose; leaf blades (4-) 5-15 mm wide .....20 *R. cephalotes* (L.) Vahl
21b. Spikelet scales puberulent; inflorescence oblong; leaf blades 2.5-6 (-10) mm wide..... ..... 54 *R. pubisquama* M. T. Strong

22a. Bristles not plumose; style base (3.5-) 4-4.1 (-4.5) mm long..... .....4 *R. amazonica* Poepp. & Kunth subsp. *amazonica*
22b. Bristles plumose, at least basally; style base 0.6-1.7 mm long 23

23a. Achenes with involute margins, the margins either winged or toothed 24
23b. Achenes biconvex or flattened, without involute or toothed margins 27

24a. Achene margins with a thin, involute, scarious, cellular-reticulate wing, connate at apex with style base ..... 11 *R. barbata* (Vahl) Kunth
24b. Achene margins toothed, wingless 25

25a. Achene lanceolate; style base lanceolate to lanceolate-attenuate, (1.3-) 1.6-2.3 mm long ..... 27 *R. dentinux* C. B. Clarke
25b. Achene elliptic-obovate or oblong-obovate; style base triangular-lanceolate, 0.7-1.6 (-1.7) mm long 26

26a. Culm solitary, arising from a well-developed, woody, knotty rhizome; leaf blades (1.5-) 2-3 mm wide ..... 69 *R. subplumosa* C. B. Clarke
26b. Culms tufted, arising from fibrous roots; leaf blades 0.9-2 mm wid .... 75 *R. trichochaeta* C. B. Clarke

27a. Inflorescence head 5-8 × 3-10 (-13) mm, subtended by 3-5 linear, scale-like involucral bracts not imbricately arranged; spikelets (1-) 2-10 (-15); achenes with conspicuous nipple-like projections medially at apex ..... 26 *R. curvula* Griseb.
27b. Inflorescence head 7-20 × 8-22 mm, subtended by > 5 widely ovate, widely oblong-ovate, or widely elliptic, acute or acuminate, subrounded to truncate, scale-like involucral bracts imbricately arranged and appearing involucre-like; spikelets 20-75 or more; achenes with or without nipple-like projections 28

28a. Involucral bracts indurate; spikelet scales ovate to oblong-ovate; style base narrowly triangular, narrower than the achene, constricted at base; achenes obovate, strongly biconvex, the surface minutely reticulate, antrorsely scabrous at apex; bristles 3-5 mm long, plumose..... ..... 36 *R. globosa* (Kunth) Roem. & Schult.

28b. Involucral bracts chartaceous; spikelet scales narrowly lanceolate; style base as wide as achene proximally, not constricted at base; achenes oblong-obovate to oblanceolate, flattened, the surface puncticulate with antrorse, nipple-like projections distally; bristles 5-9 mm long, inconspicuously plumose only at very base ..... 8 *R. armerioides* J. Presl & C. Presl

29a. Bristles absent 30
29b. Bristles present 61

30a. Spikelets congested in globose or hemispherical heads, sessile or essentially so 31
30b. Spikelets more diffuse, in open panicles, at least some pedicellate 33

31a. Mature culms stout, (3-) 3.5-9 mm wide at base; proximal spikelet scales with green, scabrous awns, the distal ones with glabrous awns; style deeply bifid, the persistent base elongate, triangular-subulate, 1-2 mm long, not constricted at its base; achenes 2.5-3.5 mm long, with longitudinal wrinkle-lines ..... 31 *R. exaltata* Kunth
31b. Mature culms slender, 1.5-2.5 mm wide at base; spikelet scales with setose trichomes along midcosta distally and extending along base of the reddish to brownish awn; style simple (unbranched) or shortly bifid at apex, the persistent base 0.5-1 mm long, constricted at its base; achenes 1.5-1.8 mm long, without longitudinal wrinkle-lines 32

32a. Heads of spikelets turbinate to hemispherical; achenes verrucose at apex, the persistent style base conic-triangular to conic-subulate ..... 44 *R. maguireana* T. Koyama
32b. Heads of spikelets globose, obloid, or very widely ovoid; achenes not verrucose at apex, the persistent style base depressed, subdiscoid ..... 67 *R. subdicephala* T. Koyama

33a. Leaves primarily cauline from base to apex with short internodes, those at base sheathing only or with short blades; style base linear-lanceolate; in the Guianas, known only from Mt. Roraima..... ..... 64 *R. splendens* Lindm.
33b. Leaves primarily basal, at most several lower cauline; style base triangular or caplike 34

34a. Apex of achene body forming a ridge which surrounds the short, thickened, mound-like or triangular style base, the margins (shoulders) often prolonged into ear-like projections on either side 35
34b. Apex of achene body at most with a wire-like margin rimming the base of the triangular style base, or the base of the style base overlapping achene apex, the margins (shoulders) rounded, not prolonged into ear-like projections 39

35a. Achene faces smooth or faintly reticulate 36
35b. Achene faces transversely rugose or rugulose 38

36a. Achene with a prolonged, tongue-like, stipitate base ..... 34 *R. filiformis* Vahl
36b. Achene base at most short-stipitate, not prolonged and tongue-like 37

37a. Spikelets 7-9 mm long; achene body 2-2.3 × 1.8-2 mm, ovate, with shallow pits on either side at base ..... 29 *R. donselaarii* M. T. Strong
37b. Spikelets 2.6-4 mm long; achene body (1-) 1.2-1.6 × (0.8-) 1-1.4 mm, elliptic, with cellular swellings on either side at base ..... 15 *R. brevirostris* Griseb.

38a. Inflorescence partial panicles open with branches up to 2 cm long; spikelet scales, particularly the lower fertile and sterile basal ones, only faintly lineolate; achene truncate at apex with a spreading, undulate rim that is not confluent with style base and has margins that are very narrowly cellular-reticulate, the surface essentially transversely rugose from margin to margin ..... 32 *R. fallax* Uittien

38b. Inflorescence partial panicles contracted with short panicle branches to 5 mm long; spikelet scales distinctly reddish brown lineolate; achene apex prolonged on either side as an ear- or horn-like projection, with the edges of the tounge-like dilated style base decurrent along its edges and has margins that are widely cellular-reticulate papillate with only the medial area of achene transversely rugose ..... 71 *R. tenerrima* Nees ex Spreng

39a. Achene body essentially smooth, at most faintly reticulate or transversely rugulose 40
39b. Achene body distinctly transversely rugulose, rugose, or pitted-reticulate 41

40a. Achene body thickly biconvex, tumid, broadly obovate to subrounded, abruptly narrowed to short-stipitate base; style base triangular, blunt at apex; sheaths becoming fibrillose, the base of plant clothed with rusty brown fibers ..... 19 *R. caracasana* (Kunth) Boeck.
40b. Achene body thinly biconvex, not tumid, narrowly obovate, rounded-cuneate at base, estipitate; style base triangular with acute to short-acuminate apex; sheaths not fibrillose ..... 58 *R. roraimae* Kük.

41a. Achene with two oval to rounded protuberances on either side of the base of the achene, appearing as though there is a style base on both ends ..... 57 *R. riparia* (Nees) Boeck.
41b. Achene lacking protuberances at base 42

42a. Rhizome horizontally creeping, the culms spaced at intervals along the rhizome; spikelet scales bright white, rarely stramineous; style base decurrent on margins of achene to about the middle..... ..... 17 *R. candida* (Nees) Boeck.
42b. Rhizome short, not horizontally creeping or absent; spikelet scales light brown to brown, reddish brown, or dark brown; style base not decurrent to middle of achene, at most on shoulders of achene, or sometimes overlapping top half of achene 43

43a. Leaf blades, sheaths, or both, pubescent 44
43b. Leaf blades and sheaths glabrous, at most leaf blades ciliate on margins and midveins 46

44a. Lower branches of inflorescence panicle arching, the spikelets on long pedicels, nodding; achene transversely rugulose, with undulating, vertically oriented, linear cells..... ..... 28 *R. divaricata* (Ham.) M. T. Strong
44b. Lower branches of inflorescence panicle ascending to divergent, not bending over, the spikelets on short pedicels, ascending; achene pitted-reticulate, with undulating rows of isodiametric cells ... 45

45a. Spikelets sessile to short-pedicellate, (2.8-) 3-4.8 (-5) mm long, often slightly falcate; achene body (0.5-) 0.6-0.8 × 0.6-0.8 mm ..... 39 *R. hirsuta* (Vahl) Vahl
45b. Spikelets long-pedicellate, 4-6 mm long, straight; achene body 1.1-1.2 × 0.9-1.1 mm..... ..... 68 *R. sublanata* Lindeman & Donsel.

46a. Spikelets 1.5-2 mm long; style base forming 2 strap-like lobes proximally which are decurrent on shoulders of achene body, abruptly contracted distally into a short triangular-lanceolate tip..... ..... 23 *R. contracta* (Nees) Raynal
46b. Spikelets 2.5-11 mm long; style base not strap-like proximally, trigonous, depressed-trigonous, cap-like, or subdiscoid, not abruptly contracted distally except for *R. saxisavannicola*..... 47

47a. Relatively coarse rhizomatous perennials; culms solitary or sometimes 2 or 3 together from nodes of the rhizome; achenes 1.4-2 mm long 48
47b. Caespitose perennials or annuals; culms aggregated in large or small tufts; achenes 0.6-1.4 mm long 50

48a. Inflorescence contracted, (1.5-) 2-4 cm in diam.; spikelets 4-5 mm long; style base not 2-lobed nor overlapping summit of achene body ..... 60 *R. rupicola* M. T. Strong
48b. Inflorescence open, 2.5-15 × 2-11 cm; spikelets 5-11 mm long; style base 2-lobed and often overlapping summit of achene body 49

49a. Spikelet scales 6.5-8.5 mm long; achenes obovate-orbicular to suborbicular, rounded at both ends, transversely rugulose; style base depressed, sublunate, 0.2-0.4 mm long .. 16 *R. cajennensis* Boeck.
49b. Spikelet scales 3.2-6.2 mm long; achenes obovate or obovate-deltate, truncate at apex, cuneate at base, transversely rugulose-papillate, with cellular-reticulate-papillate margins; style base triangular to triangular-lanceolate, 0.8-1.2 mm long ..... 79 *R. velutina* (Kunth) Boeck.

50a. Spikelets many-flowered with only one sterile basal scale above the prophyllar bract; fertile scales (subtending florets) 20-30; spikelet scales appearing blackish, medium brown to reddish brown with very fine dark brown or blackish lineations ..... 48 *R. nitens* (Vahl) A. Gray
50b. Spikelets few-flowered with 2 or 3 sterile basal scales above the prophyllar bract; fertile scales (subtending florets) 3-6 (-8); spikelet scales not appearing blackish, whitish stramineous to brown or reddish brown, if lineolate, not blackish lineolate 51

51a. Spikelets 6-9 mm long 52
51b. Spikelets 2.5-5 mm long 53

52a. Achene asymetrically biconvex, thicker near apex, obovate to narrowly obovate, widest at apex, estipitate at base; style base depressed-triangular, entire or scarcely 2-lobed..... ..... 65 *R. spruceana* C. B. Clarke
52b. Achene biconvex, turgid medially, transversely oblong or quadrate, widest at middle, with short-stipitate base; style base triangular, 2-lobed or shallowly 2-lobed ..... 30 *R. emaciata* (Nees) Boeck.

53a. Scales dark brown on sides; achenes broadly biconvex to nearly globular; style base depressed-trigonous or narrowly discoid, not lobed basally, elliptic as seen from above..... ..... 70 *R. tenella* (Nees) Boeck.
53b. Scales light brown to stramineous or whitish; achenes biconvex, obovate, obpyriform, subrounded, oblate, or widely transversely oblong (quadrate); style base often 2-lobed basally 54

54a. Achene cordate or rounded-cordate at base; style base narrowly triangular-lanceolate with a flaring, 2-lobed base (shaped like a witch's hat)..... 24 *R. cordatachenia* M. T. Strong
54b. Achenes narrowed or subrounded at base; style base triangular or depressed-triangular 55

55a. Achenes subrounded, oblate, widely transversely oblong, or quadrate, narrowed abruptly to a stipitate base, often with a longitudinal dark gray band or patch medially on each side 56
55b. Achenes obovate or obpyriform, gradually narrowed to base, brown, pale brown, or flecked with gray 57

56a. Achenes rounded to oblate; style base triangular, shallowly and shortly 2-lobed, 0.1-0.2 mm wide at base ..... 42 *R. junciformis* (Kunth) Boeck.
56b. Achenes transversely oblong or quadrate; style base depressed-trigonous, broadly 2-lobed, 0.6-0.9 mm wide at base ..... 30 *R. emaciata* (Nees) Boeck.

57a. Achene narrowly obovate, coarsely rugose with 5 or 6 rugae per face .... 61*R. sanariapensis* Steyerm.
57b. Achene obovate or elliptic, rugulose with 7-12 rugae per face 58

58a. Roots often golden yellow; scales stramineous to whitish; achene obpyriform, cuneate at base, short-stipitate; style base cap-like, indistinctly 2-lobed, the lobes not extending along shoulders of achene body ..... 2 *R. albida* (Nees) Boeck.

58b. Roots brown; scales light brown; achene obovate, broadly obovate, broadly elliptic, or subrounded, estipitate; style base distinctly 2-lobed, the lobes extending along shoulders of achene body 59

59a. Spikelet rachilla strongly flexuose at maturity; achenes 0.5-0.7 mm wide; base of style base 0.2-0.3 mm wide; endemic to Suriname, only known from seeps on granitic outcrops (inselbergs)..... ..... 62 *R. saxisavannicola* M. T. Strong

59b. Spikelet rachilla not strongly flexuose; achenes 0.8-1 mm wide; base of style base 0.5-0.7 mm wide; wide-ranging species 60

60a. Corymb rays elongate: spikelets straight or nearly so, 4-9 mm long; anthers 2-3 mm long; achenes obovate, 1-1.4 mm long ..... 73 *R. tenuis* Willd. ex Link subsp. *tenuis*

60b. Corymb rays short; spikelets falcate, 2-4 mm long; anthers 0.8-1 mm long; achenes subrounded-obovate, 0.6-0.9 mm long ..... 72 *R. tenuis* subsp. *austrobrasiliensis* T. Koyama

61a. Style entire or at most very shortly bifid at tip 62

61b. Style distinctly 2-branched 73

62a. Achene margins irregular, thickened with constrictions and protuberances; style base spongy-thickened with 2-lobed sagittate base, as wide as and as thick as or slightly wider and thicker than achene body at base with a longitudinal medial groove on both sides 63

62b. Achene margins entire or flaring at apex in one species; style base not spongy-thickened, brittle, at most shallowly lobed at base, often narrower and thinner than achene body with a plane surface on both sides 64

63a. Adaxial surface of leaf blades dark green, smooth and glossy, the abaxial surface green, with cross partitions between veins; spikelets in globose clusters at branch tips ..... 35 *R. gigantea* Link

63b. Adaxial and abaxial surfaces of leaf blades green, semi-glossy, the abaxial surface lacking cross partions between veins; spikelets in hemispherical fascicles at branch tips..... ..... 25 *R. corymbosa* (L.) Britton

64a. Achene surface cancellate with 6-sided, horizontally-oriented rectangular cells; style base triangular-lanceolate, smooth on margins, 0.6-2 mm long 65

64b. Achene surface puncticulate, transversely rugulose, or somewhat smooth, with 6-sided isodiametric or vertically-oriented linear cells; style base linear-lanceolate to linear, often antrorsely spinulose on margins, (1.8-) 2.3-7.3 mm long 6

65a. Ligule absent; leaf internodes widely spaced, the blades 9-23 mm wide; spikelets 7-9 mm long; spikelet scales light brown to dark brown or reddish brown; bristles 2-4, exceeding achene and shorter than to equaling tip of style base ..... 41 *R. immensa* Kü.

65b. Ligule a thin line or band of tissue at adaxial junction of sheath and blade; leaf internodes short mid-culm and distally (closely spaced), the blades 1.7-10.5 mm wide; spikelets 3.8-7.5 (-8) mm long; spikelet scales stramineous to whitish; bristles 0-3 (-6), rudimentary or shorter than to equaling middle of achene 66

66a. Achene pyriform with 9-12 vertical rows of horizontally oriented rectangular cells; style base triangular, 0.4-1 mm long ..... 51 *R. polyphylla* (Vahl) Vahl

66b. Achene broadly rounded-obovate with 15-18 vertical rows of horizontally oriented rectangular cells; style base triangular-lanceolate, (1-) 1.6-2.3 mm long .... 78 *R. tuerckheimii* C. B. Clarke ex Kük.

67a. Style base smooth or essentially so on margins, subconfluent at base with the achene apex, the junction between the two bordered only by a low marginal ridge..... ..... 6 *R. angustipaniculata* M. T. Strong
67b. Style base antrorsely spinulose on margins, at least proximally, articulate with achene apex 68

68a. Spikelets tightly compacted in globose capitula at ray tips, (2.5-) 3-5 mm long; achene body 1.4-2 mm long ..... 40 *R. holoschoenoides* (Rich.) Herter
68b. Spikelets in fasciculate or hemispherical clusters at ray tips, 6.5-11 mm long; achene body 3-6 mm long 69

69a. Achene surface with vertically-oriented linear cells, distinctly transversely rugulose, the rugae with sharply acute ridges ..... 76 *R. triflora* Vahl
69b. Achene surface puncticulate with isodiametric cells, the cells sometimes faintly arranged in indistinct, transverse rugae at maturity 70

70a. Achene body narrowly elliptic-obovate or linear-obovate, 1.3-2 mm wide 71
70b. Achene body elliptic-obovate, 2-3 mm wide 72

71a. Spikelets ovate, (2.2-) 2.5-3.7 (-4) mm wide; spikelet scales olive brown to dark brown, with broad pale or whitish scarious margins; achene bearing two thickened lanceolate pale appendages with blunt apex along margins at base ..... 38 *R. hassleri* C. B. Clarke
71b. Spikelets narrowly elliptic-lanceolate, 1.3-2 mm wide; spikelet scales uniformly light brown; achene unappendaged at base or indistinctly so ..... 77 *R. trispicata* (Nees) Schrad. ex Steud.

72a. Inflorescence a single, simple, terminal, loosely congested corymbose panicle or glomerate head of spikelets at the apex of the culm ..... 4 *R. amazonica* Poepp. & Kunth subsp. *amazonica*
72b. Inflorescence a terminal and a series of 1-4 lateral, remote, corymbose, loosely congested, simple to compound partial panicles from the upper leaf-like bracts..... ..... 5 *R. amazonica* subsp. *guianensis* (Kük.) T. Koyama

73a. Achene surface transversely rugulose with vertically-oriented linear cells 74
73b. Achene surface smooth or faintly cellular-reticulate with isodiametric cells 77

74a. Achene linear-oblong, linear-obovate, or oblong-obovate 75
74b. Achene obovate to elliptic obovate or obpyriform 76

75a. Slender perennial, 6-35 cm tall; leaf blades filiform, crescentiform-involute to subterete distally, 0.2-0.3 mm wide; style base depressed-triangular or subflattened-discoid, 0.2-0.4 mm long; bristles short, to ½ length of achene body, sometimes 1 or 2 rudimentary ..... 74 *R. tepuiana* Steyerm.
75b. Medium-sized rhizomatous perennial, 27-102 cm tall; leaf blades linear, (1.2-) 1.4-4.7 mm wide, V-shaped proximally to recurved-plicate distally; style base triangular-lanceolate, 1-1.8 mm long; bristles elongate, exceeding the style base ..... 14 *R. brasiliensis* Boeck.

76a. Bristles often 3 times as long as achene, exceeding style base; style base triangular-lanceolate, smooth on margins, 1.2-1.6 mm long ..... 45 *R. marisculus* Nees
76b. Bristles shorter than to as long as or slightly longer than achene, rarely exceeding style base; style base triangular or deltate, often scabrous on margins, 0.2-1.1 mm long ... 59 *R. rugosa* (Vahl) Gale

77a. Bristles short to rudimentary, rarely one equaling length of achene body 78
77b. Bristles well-developed, exceeding length of achene body, rarely several equaling or shorter than achene body 79

78a. Inflorescence a terminal, compound, cymose panicle with diffusely spreading branches; spikelets often proliferating; achene narrowly elliptic-obovate, 1.4-2 × 0.5-0.8 mm ..... 63 *R. schomburgkiana* (Boeck.) T. Koyama
78b. Inflorescence a terminal and series of 1 or 2 lateral, small, obtriangular or narrowly elliptic partial panicles of fasicicled spikelets; spikelets not proliferating; achene obovate. 1.2-1.4 × 1-1.1 mm ..... 13 *R. brachychaeta* Wright

79a. Achene sides with tumid or bulging centers which are often of a different color 80
79b. Achenes sides convex or plane, not colored differently 81

80a. Inflorescence abruptly bent over towards apex; achene orange-brown with light brown center; style base triangular-lanceolate, attenuate to tip, antrorsely spinulose-scabrous on margins.....
..... 37 *R. harperi* Small
80b. Inflorescence straight, not apruptly bent over towards apex; achene dark brown to blackish with yellowish brown to deep red center; style base triangular, smooth to slightly scabridulous..... ..... 33 *R. fascicularis* (Michx.) Vahl

81a. Leaf blades 1-3.5 mm wide; inflorescence panicle or partial panicles 1.4-2 cm long, each with less than 10 spikelets ..... 12 *R. bolivarana* Steyerm.
81b. Leaf blades 2.5-25 mm wide; inflorescence panicle or partial panicles 1.8-4.5 (-5) cm long, each with more than 10 spikelets 82

82a. Inflorescence panicle or partial panicles contracted, the spikelets densely congested with little lateral branching evident from the main axis 83
82b. Inflorescence panicle or partial panicles open, the spikelets laxly disposed and borne singly or in small fascicles on lateral branches evident from the main axis 84

83a. Spikelet scales glabrous; inflorescence ovoid to oblong-ovoid, pyramidal or subglobose; leaf blades (4-) 5-15 mm wide ..... 20 *R. cephalotes* (L.) Vahl
83b. Spikelet scales puberulent; inflorescence narrow, oblong; leaf blades 2.5-6 (-10) mm wide.....
..... 54 *R. pubisquama* M. T. Strong

84a. Leaf blades with whitish, stiffish trichomes abaxially and along margins proximally .....
..... 22 *R. comata* (Link) Roem. & Schult.
84b. Leaf blades glabrous abaxially and on margins proximally 85

85a. Achene obovate, 1-1.3 mm long, the broadly acute or subrounded apex with a pale, distinct rim extending downwards along margins; style base triangular or triangular-sagittate, ca. 1 mm long.....
..... 10 *R. bakhuisensis* M. T. Strong
85b. Achene obpyriform to subturbinate, 2-2.2 mm long (including stipe-like base), not rimmed along margins, slenderly attenuate to a stipe-like base; style base triangular-lanceolate to lanceolate, (1.1-) 1.2-1.5 (-1.6) mm long ..... 9 *R. ayangannensis* M. T. Strong

1. Rhynchospora albescens (Miq.) Kük., Bot. Jahrb. Syst. 75: 304. 1951. *Isolepis albescens* Miq., Linnaea 19: 226. 1847. TYPE: Suriname; Para District, "Crescit ad ripam rivuli Corropinae, in Para" [Koropina Creek], *Focke 1074* (holotype: U!). Figs. 2, 76A-B.
Rhynchospora monostachya Boeck., Allg. Bot. Z. Syst. 2: 78. 1896, non Steudel, 1855.

Dichromena monostachya C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 32. 1908. TYPE: Brazil; Pará, Santarem near Paria, *Spruce s.n.* (holotype: M; isotypes: B, NY!).
[*Psilocarya monostachya* Spruce ex Boeck., Allg. Bot. Z. Syst. 2: 79. 1896, *nom. in syn.*].

Stoloniferous dwarf annual or perennial, 1.5-9 (-10) cm tall; stolons slender, 0.4-0.6 mm wide, elongate, branched, to 2 cm or more long, rooting at nodes; roots fine; sheathing base of culm just above rootstock 0.5-1.5 mm wide. Culms erect to ascending, 0.2-0.4 mm wide, subterete or subcompressed, pale green with 5 coarse green ribs, the ribs glabrous to sparsely hirtellous. Leaves several, primarily basal, 0 or 1 cauline, 4-30 (-35) mm long; sheaths eligulate, short, finely veined with pale green or whitish veins, glabrous to sparsely hirtellous on veins, green, often pale at base, the inner band membranous, with truncate to concave hirtellous orifice; blades linear, 0.8-2(-2.6) mm wide, glabrous to sparsely hirtellous with antrorsely scabrous margins, finely veined, the veins pale green or whitish. Inflorescence a solitary spikelet at the summit of the culm; involucral bracts 2 or 3, the upper reduced, scale-like, whitened, the lowermost one leaf-like, often overtopping the spikelet, to 8 mm long, green but often pale at base; spikelet ovoid to widely ovoid, 2.3-4 (-4.2) × 1.7-2.5 mm, acute at apex, short-cuneate to broadly obtuse or subrounded at base; scales 16-26 per spikelet, dorsally obtuse to broadly obtuse; fertile scales 15-25, white, the upper reddish lineolate, 1.5-2 × (1.2-) 1.4-2.5 mm, ovate to rounded or the lowermost sometimes oblate, obtusely rounded at apex, the midcosta inconspicuous, prolonged beyond apex as a short mucro, at least on lower scales; sterile scale 1 at base, borne above the uppermost scale-like involucral bract, like the fertile. Stamens 2, the anthers 0.5-0.7 mm long, with a minutly prickly, subulate-apiculus at apex, truncate at base; style 2-branched, the branches as long as or longer than the unbranched portion, minutely scaly. Achene biconvex, obovate to very broadly obovate, 0.7-0.9 × 0.7-1 mm, surface transversely rugulose-papillose to transversely rugose, stramineous to dark brown or blackish, the apex broadly rounded; epidermal cells rectangular, vertically oriented; style base very shallowly lunate, 1-2 mm long × 0.6-0.8 mm wide at base; bristles absent.

Distribution: Central America (Costa Rica) and northern South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: Often in acidic, wet or damp, bare sand or mud along edges of black water creeks, streams, and rivers in forested areas, or borders of seasonal ponds in savanna, 100-300 m.

Distinguishing features: The dwarf habit and white or whitish unispiculate inflorescence of this species distinguish it from all other *Rhynchospora* in the Guianas.

Specimens examined: FRENCH GUIANA: Saül, 15 Mar 1976, *A. Raynal-Roques 18642* (P). GUYANA: Mt. Roraima, Limao, 21 Sep 1927, *G.H.H. Tate 73* (NY); Wichabai, Rupununi River basin, 25-26 Oct 1937, *A.C. Smith 2288* (F, G, K, MO, NY, P, U, US); Karanambo, Rupununi River, 5 Sep 1988, *P.J.M. Maas et al. 7286* (B, MO, NY, U, US); Dadanawa, Rupununi River, 120 m, 13 Jan 1994, *M.J. Jansen-Jacobs et al. 3213* (U, US). SURINAME: Korpina Kreek, 1.5 km W of airport road at 38.5, 7 Oct 1979, *W.W. Thomas 2449* (NY).

2. Rhynchospora albida (Nees) Boeck., Linnaea 37: 561. 1873. *Haloschoenus albidus* Nees in Martius, Fl. Bras. 2(1): 122. 1842. *Dichromena albida* (Nees) Steud., Syn. Pl. Glumac. 2: 136. 1855. TYPE: Brazil; "In altis ad montem Araracoara ditionis japurensis in prov. fluminis Nigri...," *Martius s.n.* (holotype: M). Figs. 2, 86C-D.

Caespitose perennial, 11-40 cm tall; rhizome short, inconspicuous; roots medium to fine, often some golden yellow. Culms slender, often 2 or 3 together in slender leafy fascicles, these in clumps on rhizome, erect to ascending, trigonous to obtusely trigonous, firm but flexuous, finely ribbed, green, glabrous, often channeled along one side distally, the channel edges finely antrorsely scabrous. Leaves numerous, nearly erect, straight, substiffened, primarily basal, 1-3 cauline, 2-24 cm long; sheaths eligulate, short, herbaceous, finely veined, green to pale green, glabrous, inner band membranous on basal sheaths, herbaceous with only the orifice membranous on cauline sheaths, the orifice concave to U-shaped with entire margin, light reddish brown or reddish brown; blades linear, 0.6-2 mm wide (flattened), variable in cross section, crescentiform, U-shaped, V-shaped or subfolded, thickly herbaceous, substiffened, finely

veined on both surfaces, green, often finely red-lineolate or red-dotted, glabrous, finely antrorsely scabrous on margins and midvein abaxially, the apex long-attenuate, triquetrous. Inflorescence a terminal and 1 or 2 lateral loosely congested compound to rarely simple corymbose partial panicles from the upper leaf-like bracts; bracts shorter and narrower than leaf blades, usually finely red-dotted or maculate, 2.5-22 mm long; terminal panicle 0.9-4 × 0.7-2.7 cm, with 20-100 or more spikelets, lateral panicles successively smaller below, ascending to subpendent, with elongate, very slender, flexuous, flattened peduncles, antrorsely scabrous on margins; panicle branches short, trigonous, compressed trigonous, subterete or crescentiform in cross section: spikelets ovoid-lanceoloid, 3.5-5 × 0.6-1.1 mm, acuminate at apex, cuneate to shortly so at base, sometimes composed of numerous tightly fascicled sterile scales; scales 6-10 per spikelet, dorsally widely obtuse to rounded, fertile scales inrolled around flowers, lower fertile and sterile basal scales thickly herbaceous, to subcoriaceous, semi-glossy, upper fertile scales herbaceous to thinly herbaceous or submembranous, shiny, with finely cellular-striate surface, whitish to stramineous or light brown, often tinged with golden brown, glabrous, margins widely whitish translucent, finely cellular-striate, midcosta very fine, inconspicuous except at the acute to acuminate scale apex where it is prolonged beyond apex as a mucro or a short awn on proximal scales of spikelet; fertile scales 3-5, widely ovate-elliptic to ovate-elliptic or ovate-lanceolate, 2.2-3.3 (-3.6) × 1-1.7 mm; sterile scales 3-5, ovate, widely oblong-ovate, oblong-obovate or widely ovate-elliptic, 1-2 × 0.6-1.6 mm. Stamens 3, the anthers 1-1.5 mm long, apiculate at apex, truncate and papillate at base; style entire, well exserted beyond apex of subtending scale. Achene biconvex, obpyriform to obovate, 0.9-1.3 × 0.6-1 mm, obtuse to rounded at apex, cuneate to short stipe-like base, transversely rugulose, shiny, pale brown, often flecked with gray; epidermal cells rectangular, vertically oriented; style base cap-like or hat-like, somewhat variable in height, trigonous with rounded angles and apex, or depressed-trigonous, 0.1-0.4 (-0.5) × 0.4-0.6 mm, unlobed or only slightly lobed at base, brown; bristles absent.

Distribution: Northern South America (Colombia, Venezuela, Brazil, and Guyana).

Habitat in the Guianas: Damp sands or white-sand savannas, seepages, and exposed sandbars, 100-1150 m.

Distinguishing features: This species can be distinguished from *Rhynchospora tenuis* and allied species by its golden yellow roots (at least some present), stramineous to whitish spikelet scales, and short-stipitate obpyriform achene with a cap-like or hat-like style base.

Specimens examined: GUYANA: Kaieteur Savannah, Potaro River, Sep-Oct 1881, *G.S. Jenman 837* (K, P); Baramatico Savanna 4, Nov 1907, *A.W. Bartlett 98* (K); Kaieteur Plateau, Potaro River, 8 May 1944, *B. Maguire & D.B. Fanshawe 23307* (F, K, NY, U, US); Upper Mazaruni River, Imbaimadai Ayanganna Plateau, Oct 1945, *H.A. Fraser 385* (K, US); Pakaraima Mountains, Samwarakna-Tipú, Kamarang River-Wenamu Trail, 1100 m, 10 Nov 1951, *B. Maguire 32541a* (NY); Kako Savannah, 9 Oct 1960, *V. Graham 441* (K); Pakaraima Mountains, Kako Amerindian village, Kako River,13 Nov 1979, *P.J.M. Maas & L.Y.Th. Westra 4413* (K, NY, P, U); Pakaraima Mountains, Mt. Aymatoi (sandstone), 1150 m, 15 Oct 1981, *P.J.M. Maas et al. 5648* (F, K, MO, NY, U); Pakaraima Mountains, N of Imbaimadai, 05°43'N, 60°18'W, 05°43'N, 60°18'W, 518 m, 20 Jun 1986, *J.J. Pipoly & K. Alfred 7879; 7881* (US); Pakaraima Mountains, Headwaters of Mazaruni River, banks of Mazaruni River W of Imbaimadai, 05°43'N, 60°20'W, 488 m, 21 Jun 1986, *J.J. Pipoly & K. Alfred 7922* (US); Ayanganna Plateau, N of mountain center, 05°28'N, 60°04'W, 650-700 m, 01 Mar 1987, *J.J. Pipoly & G. Gharbarran 10837* (CAY, US); High savanna above Utshe River, S side overlooking Guyana and Venezuela,1000 m, 05°44'N, 61°10'W, 25 May 1990, *T. McDowell & D. Gopaul 2879* (NY, US); Pakaraima Mountains, 1 km E of basecamp, 11.4 km NE of Imbaimadai on Partang River tributary, 05°48'N, 60°14'W, 675-700 m, 25 May 1992, *B. Hoffman et al. 1860* (US); Kaieteur National Park, near airstrip, 05°11'41"N, 59°28'53"W, 400-450 m, 15 Jun 1998, *C.L. Kelloff & R. Williams 1380* (US); Imbaimadai, savanna near airstrip, 05°42'30"N, 60°18'00"W, 500 m, 2 July 2004, *H.D. Clarke et al. 12353* (US).

3. Rhynchospora albomarginata Kük., Bot. Jahrb. Syst. 75: 125. 1951. TYPE: Brazil; Amazonas, Rio Branco, Surumu in der Serra de Mairary, 1200 m, *Ule 8369* (holotype: fragment B!). Figs. 3, 60A-B.

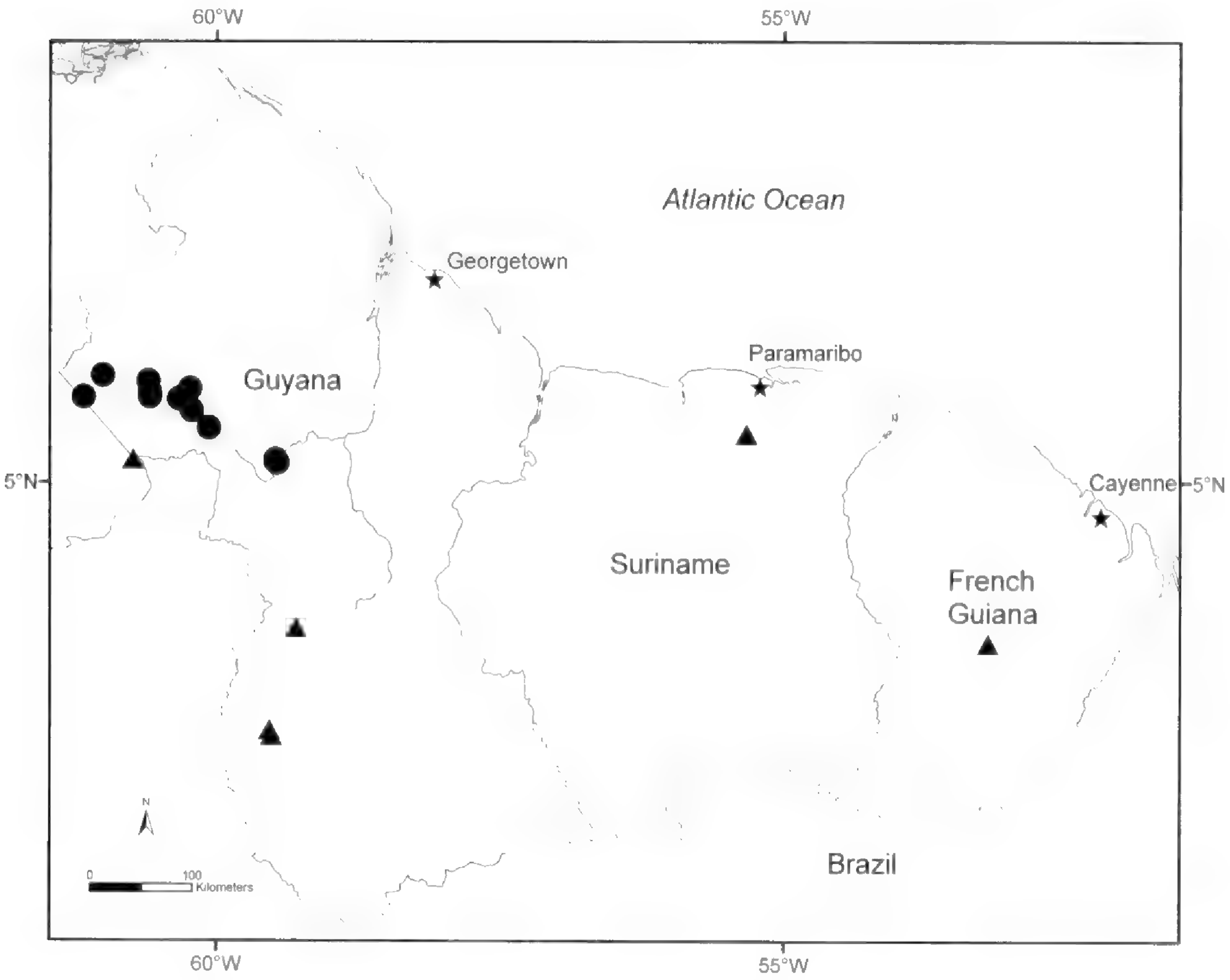

Fig. 2. Distribution of ▲*R. albescens*; and ●*R. albida* in the Guianas.

Rhynchospora baileyi Britton ex L.H. Bailey, Gentes Herb. 2: 200, f. 103. 1930. TYPE: Venezuela; Bolivar, *Bailey & Bailey 1372* (holotype: NY!; isotype: US!).

Rhizomatous perennial, 10-55 cm tall; rhizome short, thickened, horizontally creeping, 3-5 mm thick, often bearing fibrous remnants of old leaf sheaths; roots coarse; sheathing base of culm just above rootstock 4-10 mm wide. Culm ascending, 1-2 mm wide, trigonous, sometimes with obtuse to rounded angles, firm, finely and coarsely ribbed, green, glabrous except for pilose-scabrous margins at apex (just below inflorescence head). Leaves ascending, numerous, primarily basal, 1-3 cauline, 12-60 (-73) cm long; sheaths eligulate, short, herbaceous to substiffened, finely veined, green to pale brown, pubescent to glabrescent distally on inner band, the inner band herbaceous except for reddish brown, scarious, U-shaped orifice; blades narrowly linear, (1.2-) 1.5-5 (-6) mm wide at mid point, flattened to folded proximally, or sometimes subinvolute or subplicate, roughened or bluntly scabrous-papillate adaxially, often obscurely so proximally, sparsely pubescent to glabrous abaxially, finely veined, herbaceous, green, glabrous except for adaxial midvein which is pilose-scabrous, margins antrorsely scabrous, the apex long-acuminate to attenuate, triquetrous. Inflorescence a single globose tightly congested head of spikelets at the summit of the culm, 8-15 mm in diam; involucral bracts 3-4(-5), leaf-like, elongated, greatly exceeding the inflorescence, divergent to reflexed at maturity, often wooly-pubescent at base, each spikelet subtended by a linear-lanceolate to linear-setaceous ciliate-scabrous bract at base; spikelets numerous, congested in a tight head, ovoid-ellipsoid, acute to subobtuse at apex, cuneate at base, (3-) 3.3-4.1(-5) × 1-1.3 mm, with 10-16 scales per spikelet, often forming insect galls; scales rounded or subobtuse in cross section, glabrous

proximally, with crystalline trichomes distally, reddish brown, brown to dark brown on sides distally, with narrow scarious margin, margins minutely ciliate distally, entire proximally, the midcosta indistinct, very narrow, not prominent, prolonged beyond apex as a 0.5-1 mm long antrorsely scabrous, reddish to reddish brown recurved, (rarely straight) awn; fertile scales 5-7, ovate, ovate-elliptic or oblong-ovate, the uppermost often ovate-lanceolate; herbaceous to submembranous, 2.7-3.5(-4) × 1.4-2 mm, completely hidden by outer sterile scales; sterile scales 5-9, ovate, subcoriaceous, 1-2.8(-3) × 1-2 mm, the uppermost about the same size as fertile scales. Stamens 3, the anthers 1.7-2.1 mm long, apiculate at apex, lobed at base with minute papillae; style 2-branched. Achene obovate, 1.9-2 × 1.4-1.6 mm, with slightly curved truncate apex, cuneate at base, margins pale and wire-like, the surface finely cellular-reticulate, faintly rugulose, yellow-brown; epidermal cells isodiametric, no central nodules evident; style base triangular-lanceolate, 1.8-2.1 mm long and 1-1.3 mm wide at base, spongy-thickened, pale brown.

Distribution: Northern South America; in the Amazonas region of Venezuela and Brazil, Guyana, and French Guiana.

Habitat in the Guianas: Lowland to upland savanna and seepages, 80-750 m.

Distinguishing features: The single, globose, inflorescence head of congested spikelets and spikelet scales with crystalline trichomes distally, readily separates *Rhynchospora albomarginata* from its closest relative and more common, *R. cephalotes* which has an ovoid to oblong-ovoid or pyramidal inflorescence head and glabrous spikelet scales.

Specimens examined: FRENCH GUIANA: Saut du Péril, Bassin du Sinnamary, 50 m, 12 Jan 1992, *M. Hoff 7406* (CAY, US). GUYANA: Without locality, 1838, *R. Schomburgk 620* (BM, G-3, K, P, US); Potaro River, Oct 1898, *G.S. Jenman 7412* (K); Rupununi District, 6 mi. S of Lethem,16 Apr 1956, *H.S. Irwin 667* (US); Rupununi savanna, in directionem borealem de montibus Kanuku, ten z.o van Lethem, 16 Feb 1959, *J.J. Lanjouw et al. 795* (U); Orinduik, 4 Jan 1960, *S.A. Harris 7* (K-2); Annai, 150 ft, 31 Dec 1960, *V. Graham 490* (K); Partang River, Merume Mountains, 460 m, 12 Jun 1960, *S.S. Tillett & C.L. Tillett 43804* (NY); Kurikabaru, 4 Jan 1960, *S.A. Harris K24* (K); Kumu Head, Stand 38, Rupununi, 8 Oct 1963, *R.J.A. Goodland 942* (NY); 2 mi S of St. Ignatius, near Takutu, 5 Aug 1963, *R.J.A. Goodland 297* (NY); Orinduik, Apr 1968, *D.H. Davis 709* (K, NY); Imbaimadai savanna, 550 m, 21 Oct 1951, *B. Maguire 32163* (NY); N. Rupununi, Apr 1968, *D.H. Davis 775* (K, NY); Lethem, Rupununi Savanna, Feb 1974, *A. Cooper 394* (U); Pakaraima Mountains; 0.5-1 km SE of Imbaimadai towards Partang River mouth, 05°42'N, 60°17'W, 525 m, 17 May 1992, *B. Hoffman et al. 1645* (CAY, NY, U, US); S Pakaraima Mountains, Tipuru River, 4 km upstream from Ireng River, trail to Tipuru village, 04°11'48"N, 59°38'42"W, 245 m, 29 Feb 1992, *B. Hoffman & H. Jacobs 1094* (CAY, NY, U, US); Northern Rupununi savanna, 2.5 km NW of Karanambo Ranch, 03°45'54"N, 59°19'42"W, 100-120 m, 11 Mar 1992, *B. Hoffman 1252* (CAY, NY, U, US); Pakaraima Mountains, 0.5 km NW of Imbaimadai settlement, 05°42'N, 60°17'W, 525-575 m, 17 Nov 1992, *B. Hoffman 3421* (CAY, NY, US); Pakaraima Mountains, Upper Ireng River, Cipo settlement, 2 km W to Ireng River, 04°49'N, 60°02'W, 550-585 m, 15 Jan 1993, *T.W. Henkel et al. 771* (CAY, US); Surama, 04°10'N, 59°05'W, 80 m, 1 Dec 1995, *H.D. Clarke 694* (US); Rupununi Northern Savanna, Karanambo Ranch headquarters, near Rupununi River, 03°45'N, 59°10'W, 80 m, 23 Oct 1996, *C.N. Horn & J. Wiersema 11095* (US); Makarapan Mountain, 1-2 km S of camp at base of southern side of mountain, 03°56'59"N, 58°52'03"W, 100 m, 2 Oct 1997, *H.D. Clarke et al. 7032* (NY, US).

4. Rhynchospora amazonica subsp. **amazonica**

Poepp. & Kunth in Kunth, Enum. Pl. 2: 292. 1837. *Ephippiorhynchium longirostre* var. *amazonicum* (Poepp. & Kunth) Nees in Martius, Fl. Bras. 2(1): 136. 1842. *Dichromena amazonica* (Poepp. & Kunth) J. F. Macbr., Publ. Field Mus. Nat. Hist. Bot. Ser. 11: 6. 1931. *Rhynchospora corniculata* subsp. *amazonica* (Poepp. & Kunth) H. Pfeiff., Repert. Sp. Nov. Regni Veg. 49: 76. 1940. TYPE: Brazil; "Prope Ega, ad fluvium Amazonum, in sylvis siccis," *Poeppig s.n.* (holotype: B, destroyed, photo US ex B). Figs. 4, 58A-B.

Medium-sized rhizomatous perennial, 30-80 cm tall; rhizome short, hardened, knotty; roots 0.5-1 mm thick, brown; sheathing base of culm just above rootstock 4-9 mm wide. Culms ascending,

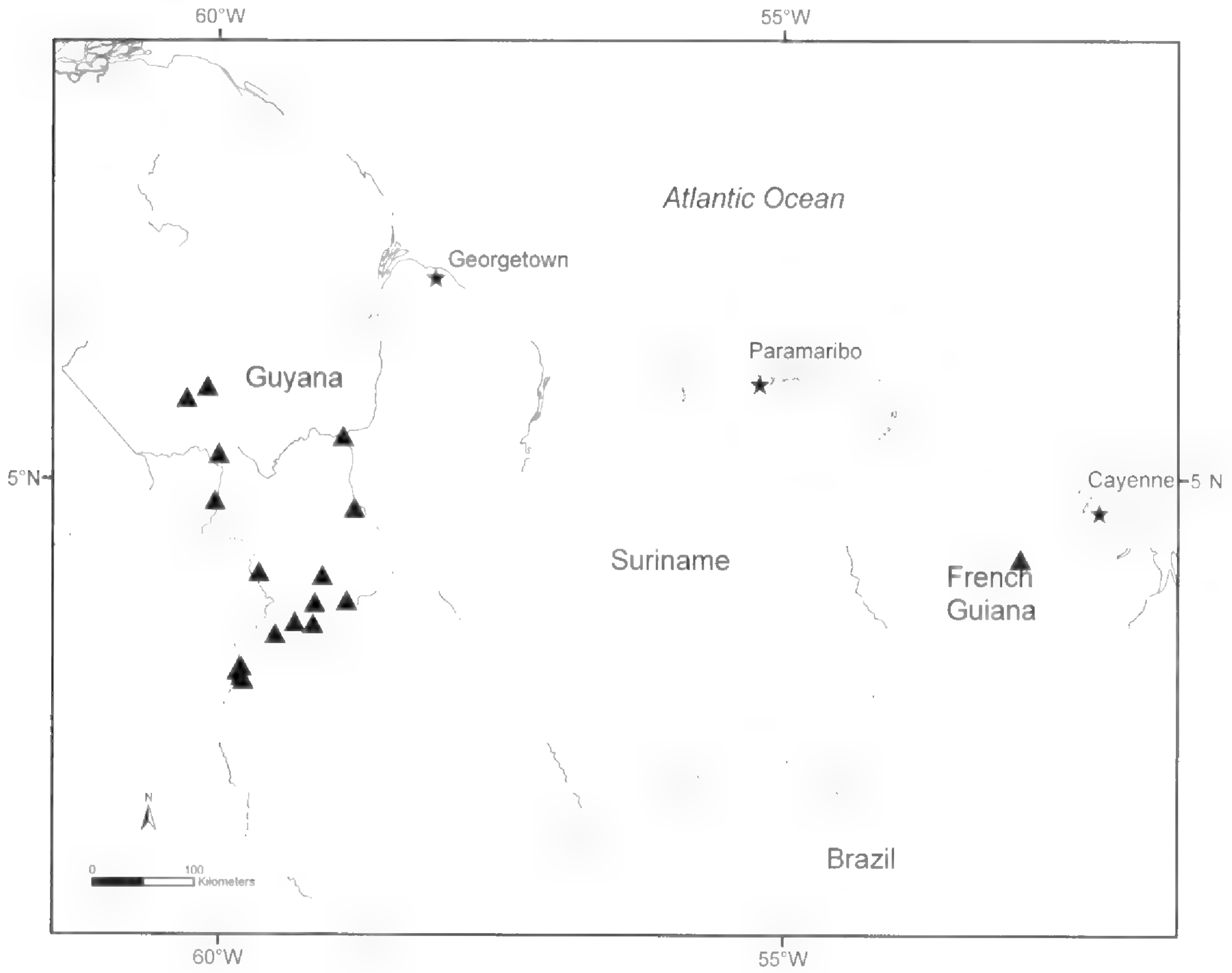

Fig. 3. Distribution of *Rhynchospora albomarginata* in the Guianas.

0.8-2.2 mm wide, trigonous, shallowly channeled along one side distally, finely ribbed, smooth, glabrous, green, often antrorsely scabrous distally along margins. Leaves 4-9, primarily basal, 1 or 2 middle and lower cauline, 19-60 cm long; sheaths finely veined, eligulate, green, glabrous, the inner band membranous on lower sheaths, splitting with age, herbaceous on upper sheaths except for the truncate to convex scarious-tipped orifice; blades linear, flattened to subplicate, (4-) 5-10 (-11) mm wide, finely veined, smooth, green, glabrous, scabrous to remotely scabrous distally on margins and midvein beneath, the apex acuminate. Inflorescence a single, simple, terminal loosely congested corymbose panicle or glomerate head of spikelets at the apex of the culm, 3-7.5 × 1.5-4 cm (panicle), (0.8-) 1-2 cm × 1.5-2 mm (head); involucral bracts 3-5, leaf-like, reduced; peduncles slender, 0.8-1.5 mm wide, trigonous to compressed-trigonous, finely ribbed, antrorsely scabrous on margins; rays flattened-trigonous to crescentiform, antrorsely scabrous on margins, the spikelets in hemispherical clusters at ray tips; spikelets 20-50, narrowly ovate-elliptic, acute to acuminate at apex, cuneate to broadly so at base, 7-9 × (1.5-) 2-2.8 mm, 2-flowered, maturing a single achene; scales 8-10 per spikelet, excluding the 2-nerved ovate prophyll with obtuse apex at base of spikelet, thin, herbaceous or membranous (distal spikelet scales), obtuse to broadly rounded in cross section, uniformly light green to green, glabrous, margins entire, widely scarious, midcosta green, narrow, wire-like, inconspicuous, prolonged beyond the acute to acuminate apex as a short mucro; fertile scales 2, the lower of the two subtending a bisexual flower, the upper a staminate, ovate-elliptic to ovate-lanceolate, (4.6-) 5-8 × (2.5 -) 2.8-4.5 mm; sterile scales 3 or 4, ovate, 1.2-3.2 × 1.2-2.5 mm, reduced but like the fertile; sterile distal scales (hidden by the fertile) about as long

and as wide as the fertile, soft and membranous, wrinkled and puckered. Stamens 3, the anthers 1.9-2.2 mm long, subulate-apiculate at apex, truncate at base; style unbranched or shortly bilobed at apex, long-exserted from the scales. Achenes elliptic-obovate, (3.3-) 3.5-4.5 × 2-3 mm, papilliate, brown, short-stipitate at base, the apex rounded, spinulose on margins; epidermal cells isodiametric, with conical central nodules; style base linear-lanceolate, (3.5-) 4-4.1 (-4.5) mm long, 0.6-0.9 mm wide at base, 4-sided proximally, antrorsely scabrous on margins, pale brown, brown lineolate, the margins at base rounded to truncate, overlapping apex of achene; bristles 6, filiform, antrorsely barbed with dark brown to blackish barbs, equaling to barely exceeding achene body.

Distribution: South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, Peru, Bolivia, and Ecuador).

Habitat in the Guianas: River banks in riparian forest; seasonally flooded forests, 50-250 m.

Distinguishing features: Of those species of *Rhynchospora* section *Longirostres* in the Guianas having achenes with elongate, linear or linear-lanceolate style bases (Figs. 56C-D, 57C-D, and 58), this subspecies of *R. amazonica* has a single, simple, terminal loosely congested corymbose panicle or glomerate head of spikelets at the apex of the culm, while other species in this section typically have open paniculate inflorescences or a series of partial panicles from the upper leaf-like bracts.

Specimens examined: FRENCH GUIANA: Lieu-dit "Savanne Mandé," Oyapock, 13 Dec 1965, *R. A.A. Oldeman 1744* (CAY, P, U). GUYANA: Kassakaityu River, 15-20 km from juncture with Essequibo River, 01°49'N, 58°40'W, 250 m, 22 Mar 1994, *T.W. Henkel et al. 5258* (CAY, US); Iwokrama Rainforest Reserve; Turtle Pond transect, 1 km E of 2.4 km transect point, 04°45'N, 58°44'W, 60 m, 28 Mar 1996, *H.D. Clarke 1478* (US). SURINAME: Ulemari Riv. Kuluapan, 13 km upstream of confluence with Litani Riv., 03°13'23"N, 54°15'38"W, 05 Apr 1998, *Raghoenandan et al. UVS 17802* (U).

5. Rhynchospora amazonica subsp. **guianensis** (Kük.) T. Koyama, Mem. New York Bot. Gard. 23: 28. 1972. *Rhynchospora amazonica* var. *guianensis* Kük., Bot. Jahrb. Syst. 74: 425. 1949. *Calyptrostylis longirostris* Nees, Companion Bot. Mag. 2: 394. 1836. *Ephippiorhynchium longirostre* (Nees) Nees in Martius, Fl. Bras. 2(1): 136. 1842. *Rhynchospora longirostris* (Nees) Steud., Syn. Pl. Glumac. 2: 145. 1855, non Elliott, 1921. TYPE: Guyana (Guiana anglica interior), *Schomburgk 915* (holotype: B, destroyed; isotypes: BM!, G!, P-2, US!, W). Figs. 4, 58C-D.

Medium-sized rhizomatous perennial, 70-150 cm tall; rhizome short, hardened, knotty; roots 0.5-1 mm thick, brown; sheathing base of culm just above rootstock ca. 1 cm wide. Culms ascending, (1-) 1.5-4 (-4.5) mm wide, trigonous to obtusely trigonous, channeled along one side distally, finely ribbed, smooth, glabrous, green, often antrorsely scabrous distally along margins. Leaves 7-10, basal and cauline, 19-60 cm long, the cauline with elongate internodes; sheaths finely veined, green, glabrous, the inner band membranous on lower sheaths, splitting with age, herbaceous on upper sheaths except for the truncate to convex scarious-tipped orifice; blades linear, V-shaped proximally, flattened-plicate distally, (4-) 5-10 (-11) mm wide, thickly herbaceous to subcoriaceous, finely veined, smooth, green, glabrous, scabrous to remotely scabrous distally on margins and midvein beneath, the apex acuminate. Inflorescence a terminal and 1-4 lateral, remote, corymbose, loosely congested, simple to compound partial panicles from the upper leaf-like bracts; bracts reduced distally; peduncles slender, 0.8-1.5 mm wide, trigonous to compressed-trigonous, finely ribbed, antrorsely scabrous on margins; partial panicles 4-12 × 3-7 cm; branches flattened-trigonous to crescentiform, antrorsely scabrous on margins, the spikelets in hemispherical clusters or fascicles of 8-30 at branch tips; spikelets narrowly ovate-elliptic, acuminate at apex, cuneate to obtuse at base, 7-9 × (1.5-) 2-2.8 mm, 2-flowered, maturing a single achene; scales 8-10 per spikelet (excluding the 2-nerved ovate prophyll with obtuse apex at base of spikelet), texture herbaceous, broadly obtuse to subrounded dorsally, finely cellular-striate, uniformly tan, glabrous, margins broadly scarious, midcosta wire-like, pale, prolonged beyond the acute to acuminate apex as a short mucro; fertile scales 2, the lower of the two subtending a bisexual flower, the upper a staminate, ovate-elliptic to ovate-lanceolate, (4.6-) 5-8 × (2.5-) 2.8-4 mm; sterile scales 3 or 4, ovate, 1.2-3.2 × 1.2-2.5 mm, reduced but like the fertile; sterile distal scales (hidden by the fertile)

about as long and as wide as the fertile, soft and membranous, wrinkled and puckered. Stamens 3, the anthers 1.9-2.7 mm long, apiculate at apex, minutely lobed and papillate at base; style unbranched or shortly bilobed at apex, long-exserted from the scales. Achenes biconvex, the side facing the rachilla often slightly sunken, elliptic-obovate, (3.9-) 4.2-5 × 2.1-2.9 mm, rounded at apex, cuneate at base, puncticulate, often minutely antrorsely scabrous on margins and achene body at apex, uniformly brown; epidermal cells isodiametric, with conical central nodules; style base linear-lanceolate, 4-7 mm long, 0.6-0.9 mm wide at base, 4-sided proximally, antrorsely scabrous on margins, pale brown, brown lineolate, the margins of the base square to sagittate, overlapping apex of achene; bristles 6, filiform, antrorsely barbed with dark brown to blackish barbs, exceeding the achene.

Distribution: Northern South America (Venezuela, Guyana, and Brazil).

Habitat in the Guianas: Riparian forest and savanna, 50-350 m.

Specimens examined: GUYANA: Without locality, Jul 1840, *R. Schomburgk 915* (BM, G, K, P-2, US).

6. Rhynchospora angustipaniculata M. T. Strong, Novon 11: 261. 2001. TYPE: Guyana; Pataro-Siparuni Region, Summit of Mt. Kopinang, 1700-1800 m, 8 Apr. 1988, *W. Hahn et al. 4374* (holotype: BRG; isotypes: MO, NY, US sheet #03385739). Figs. 4, 5, 63C-D.

Caespitose perennial, 6-8 dm tall; rhizome short, thick; sheathing base of culm 4-6 mm wide; roots stiff, branched. Culms slender, ascending, 0.7-2 mm wide, trigonous proximally with concave

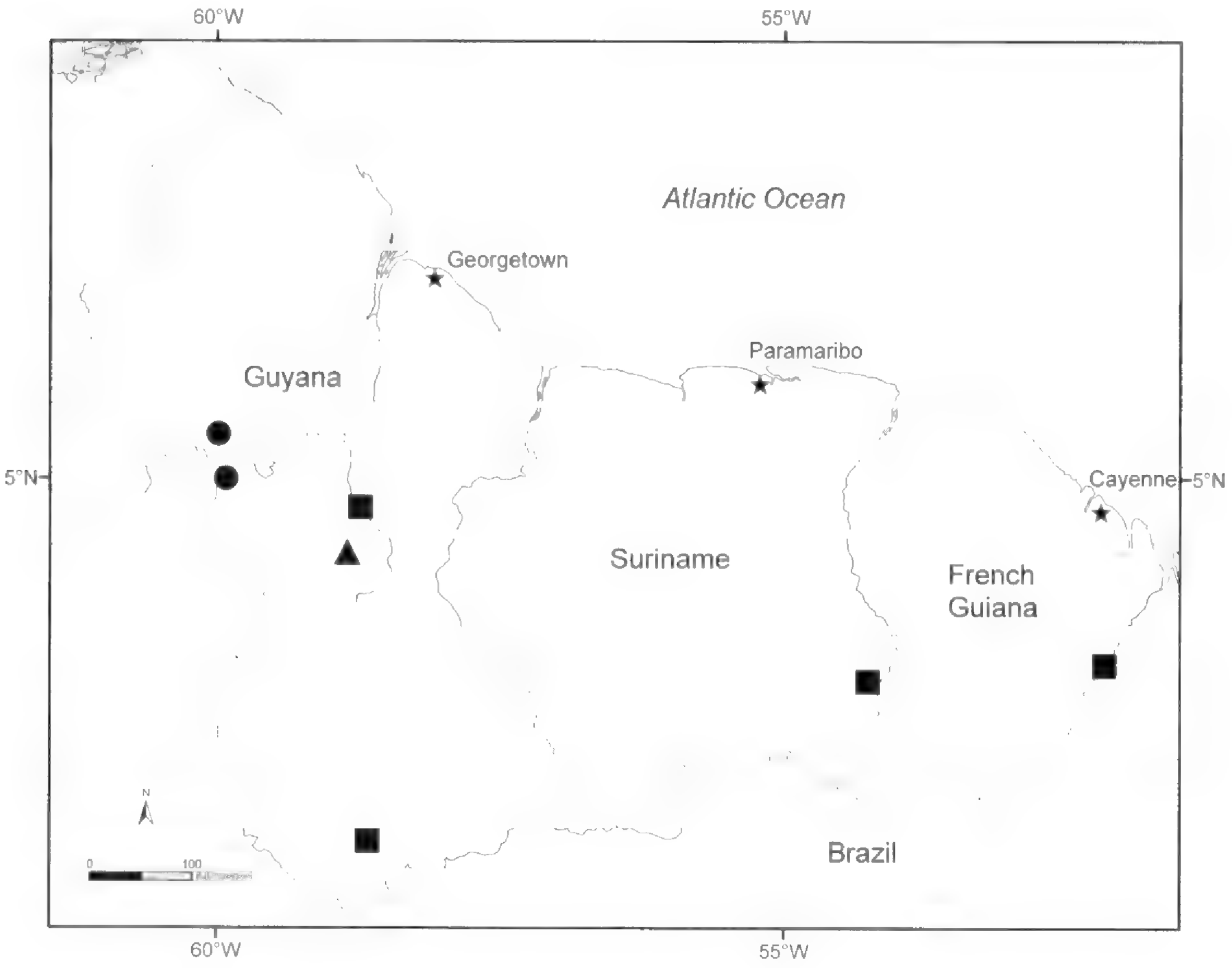

Fig. 4. Distribution of ■*Rhynchospora amazonica* subsp. *amazonica*; ▲R. *amazonica* subsp.*guianensis*; and ●*R. angustipaniculata* in the Guianas.

sides, compressed-trigonous distally, finely ribbed, smooth, green, glabrous except for appressed to ascending setose trichomes just below nodes and sometimes scattered along ribs, canaliculate along one side distally, the edges of the channel antrorsely scabrous, the bottom of the channel with setose trichomes borne singly or in tufts. Leaves ascending, primarily basal, 6-10 (including those subtending partial panicles), elongate, to 6 dm long; sheaths finely and coarsely veined, essentially glabrous near base, with setose trichomes distally, the inner band membranous, densely setose at apex, the orifice with a glabrous, reddish brown band at the concave to truncate apex, splitting with age, the adaxial surface honey-colored, the abaxial surface light brown; ligule a narrow, inconspicuous band of appressed trichomes; blades 2-5 mm wide, subinvolute, narrowly linear, flattened to plicate, long-acuminate to apex, finely veined, gray-green, becoming light brown with age, scabrous on margins and midcosta both adaxially and abaxially, the adaxial surface smooth and glabrous proximally, scabrous distally, shiny, with an inconspicuous, antrorsely scabrous midcosta, the abaxial surface smooth, honey-colored at base, glabrous except for the prominent midcosta which has dense, setose trichomes borne singly or in tufts along each side at base. Inflorescence of 2-4, narrow panicles from the upper leaf-like bracts, 2-6 × 1-2.5 cm; bracts reduced distally; peduncles compressed-trigonous or subflattened, antrorsely scabrous on angles, elongate, flexuous, 0.4-0.5 mm wide; panicle branches short, trigonous, scabrous-hispid on angles and in lines on side facing spikelet, the branches and spikelet pedicels with two prophyllar bracts at base, the lower of the two elongate and leaf-like on panicle branches, ovate-acuminate and long-awned on spikelet pedicels, the upper smaller, ovate, truncate at apex, unawned. Spikelets ovoid-lanceoloid, brown, 2-18 per panicle, solitary and short-pedicellate, mature fruiting spikelets (8-) 9-14 (-15) × 1.3-1.8 mm (at widest point), 1-1.3 mm wide at anthesis; scales 8-12 per spikelet, thin, submembranous, essentially glabrous, light brown with brown lineations, 1-costate, the costa prolonged at apex as a short, antrorsely scabrous awn, the margins narrowly scarious; fertile scales 4-7, 2-3 (-4) subtending bisexual flowers, the distal flowers staminate with abortive pistil, lanceolate-ovate, 4.5-9 × 2-3 mm, scabrous along the midcosta distally; sterile scales 4 or 5 at base, ovate, subdistichous, smaller than the fertile, 1.5-3.5 mm long (excluding awn), 1-2 mm wide. Stamens 3, the anthers linear, 2-3 mm long, apiculate at apex; style simple, unbranched, glabrous, the tip expanded. Achene biconvex, widely elliptic to elliptic-obovoid, 1.9-2.2 mm long (excluding style base), (1.3-) 1.5-1.8 mm wide, minutely and somewhat obscurely cancellate, appearing smooth at low magnification, yellowish brown; epidermal cells isodiametric, with low central nodules evident; style base triangular-lanceolate, 2.5-3.5 mm long, 1-1.2 mm wide at base, slightly 2-lobed and subconfluent at base with the achene apex, the junction of achene apex and base of the style base bordered only by a low marginal ridge, light brown to light grayish brown, thin, somewhat spongy; bristles 6, antrorsely barbed, exceeding the achene, shorter than to rarely reaching the tip of the style base.

Distribution: Endemic to Guyana.

Habitat in the Guianas: Rock outcrops on the summits of Mts. Ayanganna and Kopinang, Pakaraima Mountains, 1700-2000 m.

Specimens examined: GUYANA: Summit of Mt. Kopinang, 05°00'N, 59°55'W, 1700-1800 m, 8 Apr 1988, *W.E. Hahn et al. 4374* (BRG, MO, NY, US); Pakaraima Mountains, 2 km transect along summit ridge of Mt. Ayanganna, 05°23'N, 59°59'W, 1800-2000 m, 3 Nov 1992, *B. Hoffman & T. Henkel 3187* (BRG, MO, NY, US).

7. Rhynchospora arenicola Uittien, Recueil Trav. Bot. Néerl. 22: 335. 1925. *Rhynchospora pilosa* subsp. *arenicola* (Uittien) T. Koyama, Mem. New York Bot. Gard. 23: 61. 1972. TYPE: Suriname; Zanderij I, *Essed 87* (holotype: U!; isotypes: K!, NY!, P, US!). Figs. 6, 72A-B.

Caespitose perennial, (15-) 19-42 (-50) cm tall; rhizome short; roots coarse, rigid, brown, 1-2 mm thick. Culms ascending, 0.6-1.2 mm wide, obtusely trigonous, firm, coarsely ribbed on angles, finely ribbed and channeled on sides, edges of channel often bluntly scabrous, green, with hispid, tubercle-based trichomes distally, often glabrous below. Leaves 10-30, all basal except for a single cauline one just above base, 7-20 cm long; sheaths short, light greenish brown, coarsely veined, hispid to glabrate, inner band herbaceous, membranous at orifice, the orifice concave, brown lineolate; ligule absent; blades linear, subflattened to V-

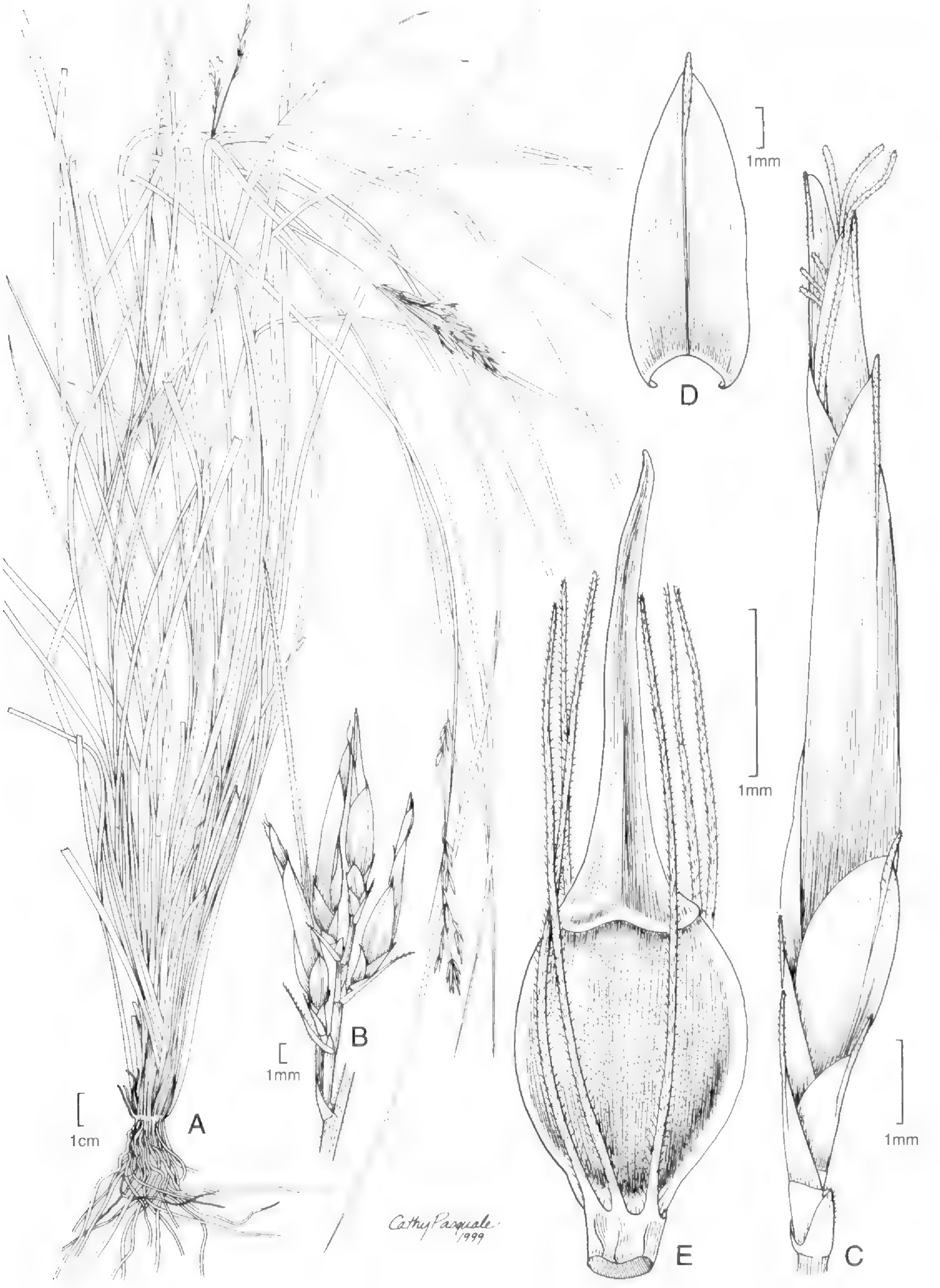

Fig. 5. *Rhynchospora angustipaniculata*. A. Habit. B. Detail of inflorescence panicle branch with spikelets. C. Spikelet. D. Lower fertile spikelet scale. E. Achene. (A-E, from the isotype, *Hahn 4374*, US).

shaped or plicate, 1.4-3 mm wide, erect and stiff, long-acuminate to apex, coarsely veined, hispid, particularly on veins both adaxially and abaxially, often glabrous adaxially except for the hispid midvein. Inflorescence a single, terminal, hemispherical, rarely subglobose congested head of spikelets at the summit of the culm, 0.8-1.6 cm in diam, narrowly obtriangular at anthesis, spreading at maturity; involucral bracts leaf-like but much reduced, 6-10, the lowest 1.5-4 (-4.5) cm long, exceeding the inflorescence, ascending in immature inflorescences, divergent to reflexed in mature inflorescences, long-ciliate on margins with tubercle-based trichomes; bracteoles linear-lanceolate; spikelets narrowly-lanceolate, (6-) 7-8 × (0.9)-1.5 mm, acuminate to acuminate-attenuate at apex, narrowly cuneate at base, laterally compressed, spreading at maturity, each subtended by an unawned, oblong-ovate, 2-nerved prophyll, with an acute to emarginate apex; scales 6-8 per spikelet, oblong-ovate to elliptic-lanceolate, laterally compressed at anthesis, acute in cross section, thinly chartaceous, with entire margins, pale green, brown medially, pubescent to glabrate, with fine indistinct nerves on each side (excluding midcosta), midcosta with 1-3 distinct veins; fertile scales 2 or 3, uppermost scales bearing 1 bisexual flower and 1 or 2 terminal staminate flowers, (4.2-) 4.5-7 mm long (excluding short awn), (1-) 1.4-2 mm wide, with indistinct, pale 1-nerved costa prolonged at the acute to acuminate apex as a short awn bearing divergent tubercle-based trichomes, the fertile scales inrolled, surrounding the subtending flower; lower sterile scales 3 or 4, shorter than fertile ones, reduced in size towards base, margins involute, the 1- to 3-nerved midcosta extending at apex as a greenish brown to brown awn, bearing long divergent tubercle-based trichomes. Stamens 2 or 3, the anthers 2.1-2.6 mm long, narrowly linear, with a dark triangular appendage at apex, truncate at base; style unbranched or shallowly bifid at apex, elongate, greatly exceeding scales, reddish, minutely scaly. Achenes obpyriform, biconvex to subrounded, 1.3-1.7 × 1-1.3 mm, light brown, transversely rugulose, with 2 small blackish triangular glands at the cellular-reticulate base; epidermal cells linear, vertically oriented; style base two-sided, subconical, 0.2-0.4 mm long, ⅓ to ½ width of achene, articulate with achene apex; bristles absent.

Distribution: Northeastern South America (Guyana, Suriname, French Guiana, Venezuela, and Brazil).

Habitat in the Guianas: In damp or wet sands of lowland to upland savanna, scrub savanna, white sand savanna, and open seeps, 240-1150 m.

Distinguishing features: See discussion under *Rhynchospora pilosa.*

Specimens examined: GUYANA: Kaieteur savanna, 300-400 m, 7 Sep 1937, *N.Y. Sandwith 1423* (K); Kaieteur Plateau, Potaro River, 300-400 m, 30 Apr 1944, *B. Maguire & D.B. Fanshawe 23115* (F, G, K, MO, NY, P, US); Pakaraima Mountains, Samwarakna-Tipú, Kamarang River-Wenamu Trail, 1100 m, 10 Nov 1951, *B. Maguire 32541b* (NY); Ando savanna, South Pakaraima Mountains, Sukabi River, affluent of Ireng River, 2400 ft, 16 Sep 1961, *B. Maguire et al. 46223* (B, F, K, NY, U, US); St. Cuthbert, Feb 1968, *D.H. Davis 636* (K); North Rupununi, Apr 1968, *D.H. Davis 778* (K, NY); Pakaraima Mountains, Mt. Aymatoi, 1150 m, 05°55'N, 61°00'W, 15 Oct 1981, *P.J.M. Maas et al. 5646* (K, NY); Pakaraima Mountains, N of Imbaimadai, 05°43'N, 60°18'W, 518 m, 20 Jun 1986, *J.J. Pipoly & K. Alfred 7913* (CAY, U, US); Karowtipu Mountain, upper Mazaruni River region, ca. 1000 m, 22 Apr 1987, *B. Boom & D. Gopaul 7612* (B, NY, P, U, US); Kaieteur Falls National Park, 05°10'N, 59°29'W, 500 m, 13 Apr 1988, *W.E. Hahn et al. 4471* (B, NY, US); Gunn's, Essequibo River, 240-260 m, 3 Sep 1989, *M.J. Jansen-Jacobs et al. 1426* (B, CAY, K, MO, NY, P, U, US); Top of escarpment above Timehri rock paintings, ± 2 km SSW of Maipuri Falls, 05°40'N, 60°17'W, 870-920 m, 23 Dec 1989, *L.J. Gillespie & D.R. Smart 2839* (CAY, MO, US); Pakaraima Mountains, 0.5 km NW of Imbaimadai settlement, 05°42'N, 60°17'W, 525-575 m, 17 Nov 1992, *B. Hoffman 3424* (NY, US); Pakaraima Mountains, between Koatse River and Chenoweing Village, 05°27'N, 60°04'W, 700-800 m, 12 Nov 1992, *B. Hoffman & T. Henkel 3352* (NY, US); Pakaraima Mountains, 1 km E of base camp, 11.4 km NE Imbaimadai on Partang River tributary, 05°48'N, 60°14'W, 675-700 m, 25 May 1992, *B. Hoffman et al. 1859* (CAY, NY, U, US); Pakaraima Mountains, Mt. Kukuinang, Kukuinang savanna, 2-3 km SSW from mountain peak, 05°04'N, 59°57'W, 950-1050 m, 27 Feb 1993, *T.W. Henkel et al. 1595* (US); Pakaraima Mountains, 1.5-2 km ESE of Imbaimadai trail along Partang River, 05°42'N, 60°17'W, 550 m, 30 May 1992, *B. Hoffman et al. 1993* (NY, U, US); Pakaraima Mountains, 0.5-1 km SE of Imbaimadai towards

Partang River mouth, 05°42'N, 60°17'W, 525 m, 17 May 1992, *B. Hoffman et al. 1667* (NY, US); South Rupununi savanna, Wakadanawa Savanna, 290 m, 8 Sep 1997, *M.J. Jansen-Jacobs et al. 5421* (NY, U, US). SURINAME: Zanderij I, Aug 1914, *E. Essed 87* (P, U); Zanderij I, savanna, Oct 1924, *E. Essed s.n.* (K); Zanderij I, 4 Jun 1944, *B. Maguire & G. Stahel 23720* (NY-2, U, US); Zanderij I, Zanderij bij vliegveld; near aerodrome, 9 Sep 1948, *J. Lanjouw & J.C. Lindeman 273* (NY, U); Sand savanna along Cordonpad between Kopie and Jodensavanne,17 Jul 1953, *J.C. Lindeman 4346* (F, U, US); Prope Jodensavanne (fluv. Suriname), 17 May 1957, *P.C. Heyligers 777* (U); Lobin-savanna inter Zanderij I & Hannover, 22 Jan 1959, *J. van Donselaar & W.A.E. van Donselaar 451a* (U); Jodensavanne-Mapane Kreek area,16 Jan 1961, *K.U. Kramer & W.H.A. Hekking 2660* (U); Jodensavanne-Mapane Kreek area (Suriname Rivier), 5 Aug 1962, *J.H.A. Boerboom 9541* (U); near Matta, Aug 1976, *R. Jansma LBB 15902* (U); vicinity of Zanderij 45-50 km S of Paramaribo, 19 Sep 1976, *S.A. Mori et al. 8358* (NY, U, US).

8. Rhynchospora armerioides J. Presl & C. Presl, Reliq. Haenk. 1: 197, t.31, fig. 2. 1828. TYPE: Panama, *Haenke s.n.* (holotype: probably at PR; isotype: K). Figs. 6, 55A-B.

Caespitose perennial, (5-) 6-45 (-55) cm tall; rhizomes short; roots medium to fine. Culm erect to ascending, 0.5-1.2 (-1.5) mm wide, obtusely trigonous to subterete, flexuous, finely ribbed and channeled, glabrous. Leaves numerous, ascending to reflexed, primarily basal, 1 or 2 short cauline ones often present below middle of culm, 5.5-16 cm long; sheaths eligulate, short, finely veined, glabrous, with a narrow, short, membranous inner band, the orifice concave; blades (0.6-) 1-3.5 (-5) mm wide, finely veined, glabrous, ciliate on margins and midvein beneath, green. Inflorescence a single hemispherical head of congested spikelets at the summit of the culm, 7-12 (-13) × (8-) 9-18 (-19) mm; involucral bracts numerous, spirally imbricated, 5-9.5 mm long (including awn), 2.3-5 mm wide, ovate to ovate-lanceolate, chartaceous, light brown, glabrous, ciliate on the margins, the apex acuminate, awn-tipped; spikelets numerous, linear-lanceolate, acuminate at apex, narrowly cuneate at base, 6-10 × 0.6-1(-1.4) mm, laterally compressed (at least when immature); scales 4-6 per spikelet, dorsally keeled, becoming acutely to subobtusely keeled with developing achenes, membranous, subtranslucent, uniformly light brown, glabrous; fertile scales 1 or 2, the proximal one subtending a bisexual flower, the terminal one sterile or sometimes bearing a staminate one, linear-lanceolate, (4.8-) 5-10 × 0.7-1.1(-1.3) mm; sterile scales 3 or 4, narrowly ovate to ovate-lanceolate, 1.3-6 × 0.4-0.8 mm. Stamens 3, the anthers linear, 1.4-2 mm long, with a triangular-subulate appendage at apex, the green body cuneate to a pale green or colorless, subulate, stipitate base above attachment to filament; style entire or shortly bi-lobed at tip, blackish. Achene bilaterally flattened, 2-2.3 × 0.6-0.9 mm, oblong-obovate to oblanceolate, dark brown, papillate to somewhat smooth except for antrorse tubercles distally on either side, the apex rounded; epidermal cells isodiametric, with conical central nodules; style base triangular to triangular-lanceolate, 0.8-1.1 mm long, 0.4-0.7 mm wide at base, about as wide as achene proximally, not constricted at base; light brown to stramineous, antrorsely scabrous on margins; bristles 6, 5-9 mm long, two to four times as long as achene body, minutely antrorsely barbed, inconspicuously plumose only at very base.

Distribution: Central America (Costa Rica and Panama) and South America (Brazil, Venezuela, Guyana, Suriname).

Habitat in the Guianas: Lowland savanna, 100-200 m.

Distinguishing features: The combination of a bilaterally flattened, narrow, oblong-obovate to oblanceolate achene; antrorse tubercles on the achene surface; and elongate bristles which are 2 to 4 times longer than the achene, separate this from other unicapitate *Rhynchospora* in the Guianas.

Specimens examined: GUYANA: Sand Creek, Rupununi River, Sep 1948, *Forestry Department British Guiana s.n.* (K); Sand Creek, Rupununi River, Sep 1948, *Forestry Department British Guiana WB158* (NY); Rupununi Northern Savanna; 5 mi. N of Meritizero, 350 ft, 2 Sep 1963, *R.J.A. Goodland 600* (US); Rupununi District, Kusad Mountains, 150-250 m, 02°45'N, 59°50'W, 30 Sep 1992, *M.J. Jansen-Jacobs et al. 2705* (B, NY, U); Dadanawa, southern Rupununi Savanna, E side of Rupununi River, 02°50'N, 59°25'W, 110-120 m, 21 Aug 1995, *S.R. Hill et al. 27343* (US); Jerome's Place, Talidku Mountain, 140 m, 7 Sep 1995, *M.J. Jansen-Jacobs et al. 5031* (U, US). SURINAME: Sipaliwini Savanne, 27 Aug 1966, *J. van Donselaar 3632* (U); Sipaliwini Savanne area on

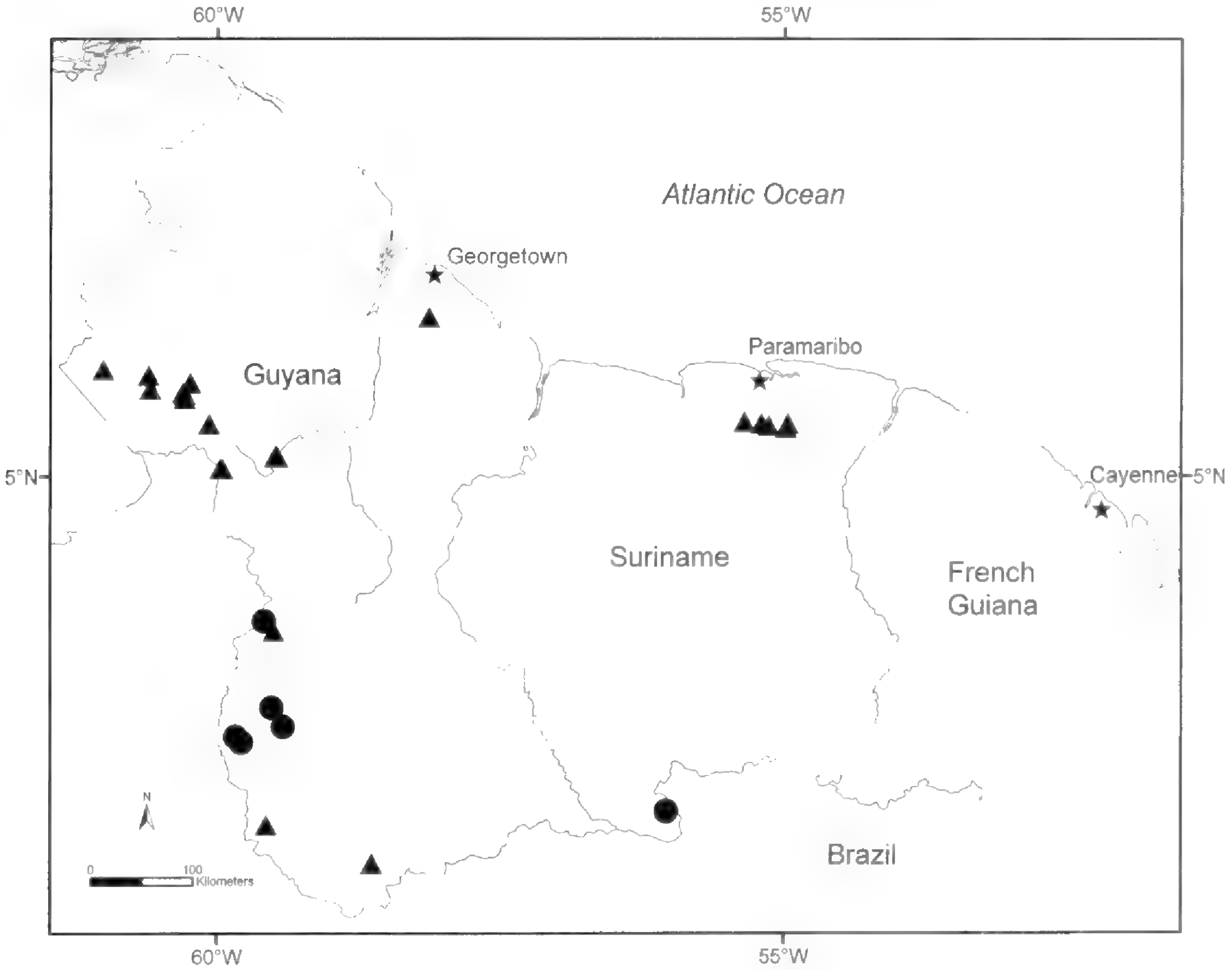

Fig. 6. Distribution of ▲*Rhynchospora arenicola* and ●*R. armerioides* in the Guianas.

Brazilian frontier, 31 Oct 1968, *F.H.F. Oldenburger & R. Norde 392* (U-2).

9. Rhynchospora ayangannensis M. T. Strong, Novon 11: 263. 2001. TYPE: Guyana; Cuyuni-Mazaruni Region, Pakaraima Mountains, northeastern plateau of Mt. Ayanganna, open scrub, moist slopes and small plateaus, occasional exposed sandstone, 1500-1650 m, 1 Nov. 1992, *T. Henkel & B. Hoffman 88* (holotype: BRG; isotypes: K, MO, NY, US sheet #03385737). Figs. 7, 10, 62C-D.

Coarse rhizomatous perennial, 1-1.5 m tall; rhizome short, bulbous-thickened, the culms borne singly or sometimes 2 together from the rhizome; sheathing base of culm 2-3 cm wide; roots coarse, stiff. Culms stout, erect to ascending, 3-6 mm wide near base, narrowing to 1 mm distally, trigonous with blunt angles, the sides plane or concave proximally, finely ribbed, smooth, glabrous, green to brownish, shallowly canaliculate along one side distally, the edges of the channel antrorsely scabrous. Leaves ascending, basal and cauline, numerous, elongate, to 1.5 m long; sheaths finely veined, glabrous, greenish brown to brown, the basal sheaths reddish brown adaxially near base, with a membranous, reddish brown inner band and deeply U-shaped orifice, splitting with age, the cauline sheaths with a herbaceous inner band and U-shaped, scarious-tipped orifice; ligule absent; blades of basal leaves narrowly linear, flattened to subplicate, 1-1.8 cm wide, finely veined, greenish brown to brown, somewhat glossy, antrorsely scabrous on margins, very long-acuminate to a trigonous-subulate apex, the adaxial surface with convex epidermal cells that give the surface a minutely bullate texture, glabrous proximally, scabrous distally, the abaxial surface minutely papillose, glabrous, the midcosta antrorsely scabrous distally, smooth below; blades of cauline leaves like the basal ones but becoming

increasingly shorter and narrower towards apex of culm. Inflorescence a terminal and 3 or 4, remote, pyramidal partial panicles from the upper leaf-like bracts; panicles (3.5-) 4-7 (-7.6) × 4-7.5 cm, the lower long-pedunculate, with 20-70 spikelets, the terminal panicle with 50-150 spikelets; bracts gradually reduced distally; peduncles slender, 0.9-1 mm wide, elongate, flexuous, subflattened to compressed-trigonous or plano-convex in cross section, finely ribbed, smooth to remotely antrorsely scabrous on angles proximally, scabrous distally on two angles, the sides glabrous; panicle branches plano-convex, trigonous, or 4-angled towards apex of main axes, the margins narrowly winged, setose-scabrous on the wing angles, each subtended by a tubular prophyll and linear bract at base of both branches and spikelet pedicels, the lower bract ovate-lanceolate, long-awned, ciliate-scabrous on margins and nerves, the upper prophyll smaller, ovate, truncate at apex, unawned, essentially glabrous. Spikelets ellipsoid, light greenish brown to stramineous, 20-60 (-95) per partial panicle, mature fruiting spikelets 5-6 × 1.8-2.5 mm, borne singly on branches, pedicelled, the terminal spikelet of a branch short-pedicelled or subsessile, the pedicels terete to subflattened, essentially glabrous; scales 13-15 per spikelet, thin, somewhat translucent, light greenish brown to stramineous, glabrous, with a single, inconspicuous, greenish midcosta, the apex acute to acuminate, short-mucronate; fertile scales 9 or 10, all subtending bisexual flowers, ovate-elliptic, (3-) 3.2-4 × (1.1-) 1.5-2.2 (-2.4) mm; sterile scales 4 or 5 at base, ovate to ovate-elliptic, smaller than the fertile, (1.4-) 1.5-2.9 (-3) × 1-1.5 (-1.6) mm. Stamens 3, the anthers linear, 0.8-1.2 mm long; styles 2-branched, glabrous, black, the branches about as long as the unbranched portion. Achene biconvex, with convex or bulging sides, obpyriform to subturbinate, 2-2.2 mm long (including stipitate base), (0.9-) 1-1.1 mm wide, inconspicuously jointed above a slenderly attenuate, stipitate base which is (0.5-) 0.6-0.8 (-0.9) mm long, shiny, shallowly cellular-reticulate to essentially smooth, orange brown to dark brown, glossy; epidermal cells irregular, somewhat isodiametric, often quadrate or subrectangular and vertically oriented, no central nodules evident; style base triangular-lanceolate to lanceolate, (1.1-) 1.2-1.5 (-1.6) mm long, thin, flattened, narrower than achene, sulcate above the ridged, obtuse to truncate apex of achene, inconspicuously cellular reticulate and wrinkled, light brown to grayish brown, sometimes whitened at base; bristles 6, antrorsely barbed, (4-) 6 greatly overtopping the achene, equaling to shortly exceeding the style base, 1 (-2) sometimes shorter than the achene or rudimentary.

Distribution: Endemic to Guyana.

Habitat in the Guianas: Mts. Ayanganna and Wokomung, Pakaraima Mountains; on moist slopes and small plateaus in low forest or open scrub, 1380-1660 m.

Discussion: Strong (2001) placed *Rhynchospora ayangannensis* in *R.* section *Pseudoaureae* C. B. Clarke because of its stout culms and well-developed leaves with blades 10-18 mm wide; inflorescence of 4 or 5, remote, pyramidal partial panicles from the upper leaf-like bracts; ovoid-ellipsoid spikelets; pale brown spikelet scales with reddish lineations; 2-branched style; glossy, orange-brown to brown, shallowly cellular-reticulate to essentially smooth achenes; and 5 or 6 well-developed antrorsely barbed perianth bristles. However, the obpyriform to subturbinate achene with stipitate base and triangular-lanceolate to lanceolate style base are uncharacteristic of other South American species assigned to that section. It is here placed in a new section, *R.* section *Stipitatae* M. T. Strong (see discussion of this section under "Infrageneric Classification"). In one of the recent collections of this species, flowers with 3-branched styles and trigonous achenes were noted in some of the spikelets while in other spikelets in the same inflorescence, typical flowers with 2-branched styles and 2-sided achenes were present. I have not noted this anomaly in any other *Rhynchospora* species I have studied.

Specimens examined: GUYANA: Mt. Ayanganna, frequent in Thompson Camp,1418 m, 12 Aug 1960, *S.S. Tillett & C.L. Tillett 45121* (NY); Pakaraima Mts, NE plateau of Mt. Ayanganna, 05°23'N, 59°58'W, 1500-1650 m, 01 Nov 1992, *T.W. Henkel & B. Hoffman 88* (BRG, K, MO, NY, US); Mt. Ayanganna, east face, plateau above second of four escarpments, 1380 m, 05°22'37"N, 59°58'21"W, 17 Jun 2001, *H.D. Clarke et al. 9266* (US); Mt. Wokomung, Little Ayanganna, summit of highest point of Mt. Wokomung massif, 05°04'53.1"N, 59°50'26.1"W, 1660 m, 05 Jul 2003, *H. D. Clarke et al. 10519* (US).

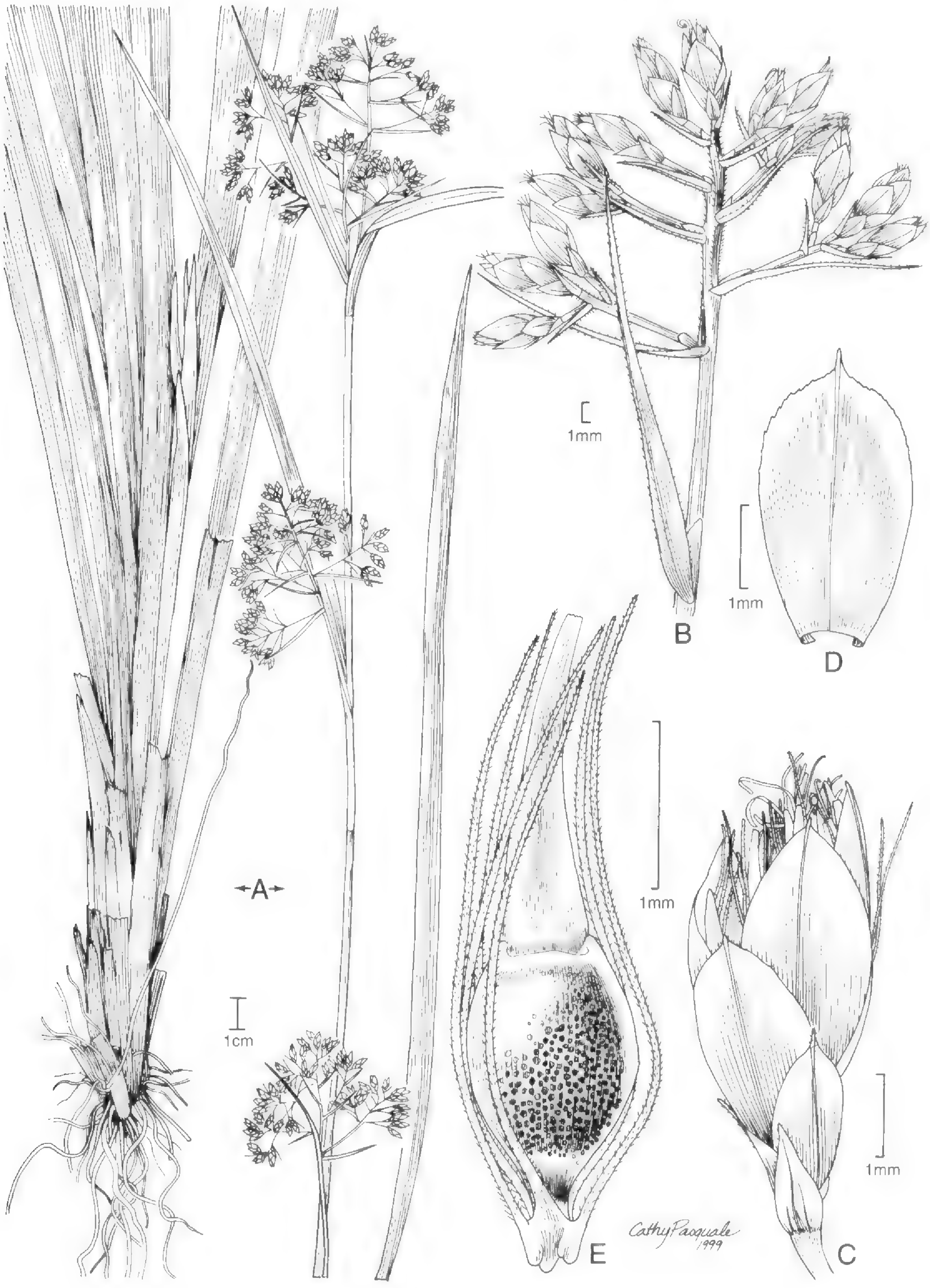

Fig. 7. *Rhynchospora ayangannensis*. A. Habit. B. Detail of inflorescence panicle branch with spikelets. C. Spikelet. D. Fertile spikelet scale. E. Achene. (A-E, from the isotype, *Henkel 88*, US).

10. Rhynchospora bakhuisensis M. T. Strong, Novon 11: 266. 2001. TYPE: Suriname; In montibus Bakhuis inter flum. Kabalebo et Coppename Sinistrum, Bakhuis Mountains, top near camp 3, 600-700 m, 22 Feb. 1965, *P. Florschütz & P. Maas 2954* (holotype: U, sheet # 029604). Figs. 8, 10, 62A-B.

Robust perennial, 1-1.5 m tall, with narrow, vertical, woody caudex bearing fibrous remnants of old leaf bases, the culms borne singly from the rhizome; roots coarse; sheathing base of culm 1-1.5 cm wide. Culm ascending, 3-6 mm wide proximally, triquetrous, firm, finely ribbed and channeled, glabrous, dark green, shallowly canaliculate along one side distally. Leaves ascending, numerous, primarily basal, 2 or 3 cauline below the inflorescence, elongate, up to 1.5 m long; sheaths short, finely veined with cross partitions between veins, glabrous, brown, inner band firm, the orifice deeply U-shaped with a ciliate margin; ligule absent; blades of basal leaves narrowly linear, flattened to subfolded or V-shaped towards base, subplicate distally, 1.2-2.5 cm wide, finely veined with cross partitions between veins, glabrous, smooth, deep green, minutely punctate between veins abaxially, bluntly scabrous on margins and midvein abaxially, long-acuminate to apex; blades of cauline leaves like the basal ones but becoming increasingly shorter and narrower towards apex of culm. Inflorescence ca. 50 cm long, of 5 remote, partial panicles (including the terminal one) from the upper leaf-like bracts, the partial panicles somewhat open, globose to obtusely trigonous, 5-6 cm in diam, with 240-320 spikelets each; bracts gradually reduced distally; peduncles short, that of the lowest panicle to 5 cm × 1-1.2 mm, slender, flattened, finely ribbed, short pubescent; panicle branches trigonous to flattened-trigonous or plano-convex, pubescent, horizontally divergent to reflexed or only the uppermost ascending, each subtended by a tubular prophyll and linear bract at base, the bract ovate-lanceolate, long-awned, ciliate-scabrous on margins and nerves, the prophyll smaller, ovate, truncate at apex, unawned, pubescent; pedicels of spikelets, when present, short, flattened-trigonous to flattened, short-pubescent, the spikelets congested at tips of lateral branches, borne singly or more commonly sessile and in fascicles of 2 or 3 at branch tips; spikelets narrowly ovoid-ellipsoid to oblong-ovoid, 3.6-5 × 1-1.2 mm, the scales spreading at maturity, the spikelets then to 2 mm wide, greatly elongating when insect galls present; scales 11-13, thinly herbaceous, light brown to reddish brown, glabrous, with narrow scarious entire margins, the narrow pale green midvein prolonged at apex as a 0.3-0.5 mm antrorsely scabrous awn; upper fertile scales 3-5, all subtending bisexual flowers, oblong-ovate, 2.4-3 × 1-1.3 mm, lower sterile scales 7-10, ovate to oblong-ovate, decreasing in length to base, 2.3-0.5 mm long. Stamens 3, the anthers linear, 1.5-2 mm long, apiculate at apex; style 2-branched, the branches minutely scaly. Achene biconvex, obovate, the broadly acute or subrounded apex with a pale, distinct rim extending downwards along angles, 1-1.3 mm long (excluding style base), 0.9-1.1 mm wide, surface reticulated at early stages of maturity, at later stages of maturity shallowly reticulated to smooth, the lighter colored cell walls strikingly contrasting with the dark brown cell bodies, shiny, brown to reddish brown at maturity; epidermal cells isodiametric, no central nodules evident; style base triangular or triangular-sagittate, ca. 1 mm long, light brown, flattened, slightly thickened, smooth on margins; bristles 6, antrorsely barbed, exceeding achene and style base, frequently 1 or 2 rudimentary or shorter than achene body.

Distribution: Endemic to Suriname.

Habitat in the Guianas: Known only from the type collection made on a mountain summit in the Bakhuis Mountains, 3600-3700 m.

Discussion: This is a species of *Rhynchospora* section *Pseudoaureae* C. B. Clarke. It is closely related to *R. paraensis* Schrad. ex Kunth but differs from that species in having glabrous culms and leaves, the blades only bluntly scabrous on margins; smaller achenes (1-1.3 × 0.9-1.1 mm); a flattened only slightly thickened style base with smooth margins; and longer perianth bristles that are from 1.5-2 times longer than those of *R. paraensis*. *Rhynchospora paraensis* differs in having finely pubescent culms and leaf sheaths, the orifice of the leaf sheath pilose; coarsely ciliate leaf blade margins; larger achenes (1.2-1.6 × 1-1.3 mm); a swollen spongy-thickened style base that is antrorsely scabrous on margins at base; and shorter perianth bristles.

11. Rhynchospora barbata (Vahl) Kunth, Enum. Pl. 2: 290. 1837. *Schoenus barbatus* Vahl, Eclog. Amer. 2: 4. 1798. TYPE: West Indies,

Fig. 8. *Rhynchospora bakhuisensis*. A. Habit. B. Detail of inflorescence panicle branch with spikelets. C. Spikelet. D. Fertile spikelet scale. E. Achene. (A-E, from the holotype, *Florschütz & Maas 2954*, U).

von Rohr 72 (holotype: C-Vahl, microfiche US ex C; possible isotype: BM!). Figs. 9, 52A-D.

Schoenus globosus Rudge, Pl. Guian. 14, t. 15. 1805. TYPE: French Guiana; Cayenne, *Martin s.n.* (holotype: BM!; isotype: F!).

Chaetospora pterocarpa Kunth in Humboldt, Bonpland, & Kunth, Nov. Gen. Sp. 1(quarto ed.): 230. 1815 [1816]. *Rhynchospora pterocarpa* (Kunth) Roem. & Schult., Syst. Veg. 2: 89. 1817. TYPE: Venezuela; "Crescit in humidus prope Atures, juxta ripam Orinocensem", *Bonpland s.n.* (holotype: P-HBK).

Rhynchospora hamiltonii Kunth, Enum. Pl. 2: 291. 1837. TYPE: French Guiana; Cayenne, *coll. ign.* (holotype: P-Desv.).

Rhynchospora heterocaulis C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 32. 1908 (in part). SYNTYPES: Suriname, *Berthoud-Coulon 52* (BM!); Brazil, *Sellow s.n.* (BM!).

Caespitose perennial, 6-65 cm tall; rhizome short, inconspicuous; roots medium to fine, 0.5-1 mm in diam. Culms erect to ascending, (0.4-) 0.5-1.4 mm wide, trigonous to obtusely trigonous or compressed-trigonous, firm but flexible, not stiffened, finely ribbed, green, glabrous, clavate at apex just below inflorescence head. Leaves ascending, numerous, primarily basal, 1 or 2 cauline near base, (4.5-) 5-45 (-56) cm long; sheaths eligulate, short, herbaceous, finely veined, green, essentially hirsute to glabrescent abaxially, glabrous adaxially, inner band membranous on basal sheaths, membranous only at apex on cauline sheaths, the orifice membranous, concave to truncate; blades linear, (0.4-) 1-5.5 (-6) mm wide (flattened), substiffened to sometimes soft, folded, plicate, or subflattened (at least distally), finely veined, green, essentially glabrous and lustrous (semi-glossy) or sometimes sparsely hirsute adaxially, hirsute to glabrescent abaxially, margins often long-ciliate, particularly proximally, and often long-ciliate on midvein both adaxially and abaxially as well, the apex long-attenuate to triquetrous apex. Inflorescence a single globose or hemispherical congested head of spikelets at the summit of the culm, (8-) 9-17 (-20) mm in diam.; principal involucral bracts 3-6, 5-53 × 1-2.3 mm, the uppermost hidden among the crowded spikelets, leaf-like but much reduced, long-ciliate along margins at base; spikelets numerous in a compact head, laterally flattened to compressed, ovate-elliptic to elliptic lanceolate, often curvate, narrowly acute to acuminate at apex, cuneate at base, 5-7.5 (-7.8) × (0.9-) 1-1.6 (-1.7) mm; scales 6 or 7 per spikelet, boat-shaped, laterally compressed at anthesis, becoming dorsally obtuse to subrounded with maturing achene, herbaceous, lustrous, glabrous, uniformly light brown to brown or sometimes dark brown with very narrow scarious margins, midcosta inconspicuous, narrow, prolonged beyond the acute to acuminate apex as a short mucro on lower scales of spikelet, the margins entire; fertile scales (3-) 4, ovate-elliptic to linear-lanceolate (apical scales of spikelet), (3.5-) 4-7 (-7.2) × 1-2.2 (-2.4) mm; sterile scales 3 (terminal scale of spikelet often empty as well), ovate to ovate-elliptic, 1.1-3.5 × 0.7-2.2 mm. Stamens 3 or sometimes 2, the anthers 1.2-2.2 mm long, minutely apiculate at apex, obtuse at base; style entire or shortly bi-lobed at apex, blackish, long-exserted and often coiling. Achene body biconvex, elliptic to elliptic-obovate, 1.3-1.7 (-2) × 0.5-1 mm, rounded at apex, subcuneate at base, epidermal surface minutely papillate, the surface at apex abaxially and medially adaxially often with elongated, crystalline papillae; margins of achene body winged, partially winged, or entire, the wing when present thin and papery, reticulate-veined, pale brown, inrolled, or truncated on each margin just below apex of body, with entire margins below, connate at apex with style base, up to 1.5 mm wide along each margin (unrolled); epidermal cells isodiametric, with conical and buttressed central nodules; style base of same texture as wing, 0.6-1.2 mm long, with light brown, brown, or brown-black medial costa, the apex acute to acuminate, confluent with marginal wings; bristles 4 or sometimes absent, filiform, reddish or pale brown, finely antrorsely barbed, often with blackish barbs, plumose at base, exceeding achene and wing-like style base, to twice as long as achene body.

Distribution: Mexico, Central America (Guatemala, Honduras, Nicaragua, Costa Rica, and Panama), West Indies (Cuba and Hispaniola), Trinidad, and South America (Venezuela, Guyana, Suriname, French Guiana, Brazil, Bolivia)

Habitat in the Guianas: Damp to wet lowland savanna to upland granite inselbergs in "savane roche" (rock savanna) communities; white-sand savanna, sandy roadsides, trailsides, sand bars along creeks, open scrub with patches of forest, 0-1800 m. This species is commonly found in a

diversity of savanna habitats throughout the Guianas.

Distinguishing features: Rhynchospora barbata is readily distinguished from all other American species of *Rhynchospora* by its winged achene margins which are thin and papery, reticulate-veined, and often inrolled. However, partially winged or wingless forms occur in populations, sometimes in the same inflorescence.

Specimens examined: FRENCH GUIANA Without locality, 1819-1821, *M. Poiteau s.n.* (G); Without locality, 1834, *M. Leprieur 89* (G, P); Cayenne, without date, *J. Martin s.n.* (BM, F); Cayenne, 1835, *M. Leprieur s.n.* (G-2, K); Cayenne, without date, *M. Perrottet s.n.* (G); Without locality, 1839, *Boivin s.n.* (G); 1840, *M. Leprieur s.n.* (G); Cayenne, Mar 1859, *P. Sagot 1360* (K, P); Without locality, 1867, *W. Parker s.n.* (K); Cayenne, without date, *von Rohr s.n.* (BM); Badoeul, vic. of Cayenne, 18 Jul 1921, *W.E. Broadway 891* (NY); Campo de Passoura, 25 Oct 1954, *G.A. Black & Klein 54-17222* (CAY, NY); Route de Rochambeau, 17 km [at airport, 17 km from Cayenne], 6 Jul 1955, *J.J. Hoock s.n.* (K, NY, U); Route de Sinamary, environs du 10 km, 1 Jun 1957, *J.J. Hoock s.n.* (K); Route de Sinamary, 01 Jun 1957, *J.J. Hoock s.n.* (NY); Route de Sinamary, entre Leanotre and Passoura, 1 Jun 1957, *Hoock, J.J. s.n.* (U); Haute Crique Armontabo, bas Oyapock, 31 Feb 1961, *J.J. de Granville 4337* (NY, P, U); Fleuve Oyapock, Savanes-Roches "Sikini", 18 Jul 1969, *R.A.A. Oldeman B2567* (CAY); Ile de Cayenne, lieu dit "Tour de l'Ile", 19 Aug 1969, *J.J. de Granville 273* (CAY, NY, P); Tumuc Humac, sommet de la borne frontière Guyane-Brésil, No. 1, 590 m, 26 Aug 1972, *J.J. de Granville 1398* (CAY, NY, P); Tumuc Humac, frontière Brésil-Guyane, sommet du Mitaraka Sud, 720 m,14 Aug 1972, *J.J. de Granville 1231* (CAY, NY, P); Haut Oyapock, Mont St. Marcel, 300-350 m, 30 Jul 1975, *J.J. de Granville 2621* (CAY, NY, U); Haut Oyapock, Mont St. Marcel, 400-450 m, 31 Jul 1975, *J.J. de Granville 2629* (CAY); Savane Changement, 6 km de Sinamary, 16 Apr 1976, *C. Sastre 4773* (CAY, P); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 25 Feb 1977, *G. Cremers & Y. Veyret 4373* (CAY, FTG, P); Savane Bordelaise, route du tour de l'île, SO. Cayenne,10 Mar 1977, *G. Cremers & Y. Veyret 4429* (CAY, FTG, P); Sinnamary, route de Ste. Elie, 21 Jul 1977, *C. Sastre 5543* (P); Fleuve Approuague, Rivière Arataye, Saut Pararé, 6 km du fleuve, 400-500 m, 29 Aug 1977, *C. Sastre 5823* (CAY, P); Fleuve Approuague, Rivière Arataye, Saut Pararé, 6 km du fleuve, 29 Aug 1977, *C. Sastre 5827* (CAY, P); Sinnamary, route de Ste. Elie, 21 Jul 1977, *C. Sastre 5526* (CAY, P); Savane de Corossony, sur la piste de St. Elie; 4 à 7 km à l'WSW de Sinnamary, 22 Dec 1977, *A. Raynal-Roques 19691* (CAY, P); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 25 Feb 1977, *G. Cremers & Y. Veyret 4354* (CAY, FTG, P); 11 km SW of Sinnamary, 05°19'N, 52°57'W, 25 Jan 1978, *A.J.M. Leeuwenberg 11645* (CAY, NY, P); Savane Bordelaise, 5 Feb 1978, *J.J. de Granville 2848* (CAY, NY); Sinnamary, route de Ste. Elie, km 2, 18 Sep 1978, *C. Sastre 6145* (P); Régina, 23 Nov 1978, *C. Sastre 6363* (P); R.N. 1, 2 km après Kourou, 24 Sep 1978, *C. Sastre 6160* (P); Bord de la piste de St. Elie, km 16, 20 Mar 1979, *M.F. Prevost 457* (CAY, P); Massif des Emerillons, versant nord, 350 m, 20 Sep 1980, *J.J. de Granville 3919* (NY, P); Massif des Emerillons, centre Petite savanna roche sur la pente est, 300-350 m, 11 Sep 1980, *G. Cremers 6629* (CAY, NY, P, U); Montagne des Trois Pitons, 8 Jun 1980, *P. Grenand 1930* (CAY, NY); Monts Bakra "savane roche" sur affleurement granitique à 1.5 km à l'Ouest du Pic Coudreau, 530 m, 2 Oct 1980, *J.J. de Granville 4089* (NY); Montagne des Trois Pitons, Inselberg, 8 Jun 1980, *P. Grenand 1929* (CAY, NY); Montagnes de la Trinité, inselberg granite au NW od Monts de al Trinite, 400 m, 5 Aug 1981, *G. Cremers 7426* (NY); Région estuaire de l'Oyapock, versant SE de la Montagne des Trois Pitons, 250 m, 21 Jan 1981, *J.J. de Granville 4297* (CAY, NY); Région estuaire de l'Oyapock, versant SE de la Montagne des Trois Pitons, 250 m, 27 Jan 1981, *J.J. de Granville 4296* (CAY, NY); NW des Monts de la Trinité, Est de la Mana, 300-400 m, 5 Aug 1981, *G. Cremers 7441* (CAY, NY, P); Route de Cayenne vers Kourou à 300 m du carrefour Rochambeau et Kourou [close to Cayenne, 20 km from], 2 Aug 1982, *A. Fournet 226* (CAY); RN 1, 5 km apres Sinnamary, 13 Aug 1982, *A. Fournet 267* (NY, P); Frontiere Guyane-Brazil, borne 4, 13 Apr 1983, *C. Feuillet 1010* (NY, P); Sinnamary, piste de St Elie, PK 2.5, 30 Jun 1983, *C. Feuillet 976* (NY); inselberg NE of Montagnes de la Trinité, 16 Jan 1984, *J.J. de Granville et al. 6020* (U); Montagnes de la Trinité, inselberg N-Ouest, 320 m, 16 Jan 1984, *J.J. de Granville et al. 6019* (B, P, U); Montagne Bruyère, sommet, 8 Apr 1984, *J.J. de Granville 6774* (B, NY, P, U); Route du Tour de

l'Ile de Cayenne, RN 2 au PK 13, 28 Mar 1986, *G. Cremers 9401* (CAY); Along Route D9 to Mana, 05°33'N, 53°56'W, 10-30 m, 18 Nov 1986, *L.E. Skog et al. 7446* (F, US); Village Galibi de Bellevue, Route Cayenne-St Laurent, PK 142, après le village de Bellevue, 5 m, 27 Dec 1986, *G. Cremers 9531* (B, CAY, NY, P, U, US); Montagnes des Nouragues, Bassin de l'Arataye, 04°03'N, 52°42'W, 27 Aug 1987, *C. Feuillet 4360* (CAY), *4361* (CAY, NY, P); Akouba Booka goo Soula, Camp #3, Roche no. 1, bassin du Haut-Marouini, 160 m, 28 Aug 1987, *J.J. de Granville et al. 9814* (US-mixed collection); Montagnes de la Trinité, inselberg NW, 320 m, 16 Jan 1984, *J.J. de Granville et al. 6019* (NY, US); Mont Belvédère, haute Camopi, 220-250 m, 21 Nov 1984, *J.J. de Granville 6942* (B, CAY, G, MO, NY, P, U, US); Route du Gallion, route du tour de l'Ile de Cayenne, D5 vers le PK 20, 10 m, 13 Dec 1986, *G. Cremers 9492* (CAY, P, US); Village Galibi de Bellevue, Route Cayenne-St. Laurent, PK 142, apres le village de Bellevue, 5 m, 27 Dec 1986, *G. Cremers 9532* (CAY, US); Piste de Saint-Elie, ébut de la piste de St. Elie, pk 4, 05°20'N, 53°00'W, 4 Feb 1987, *Riéra, B. Nx 1236* (CAY); Akouba Booka goo Soula, Camp #3, Roche no. 1, bassin du Haut-Marouini, 160 m, 26 Aug 1987, *J.J. de Granville et al. 9732* (NY, P, US); Akouba Booka goo Soula, Camp #3, Roche no. 2, bassin du Haut-Marouini,180 m, 29 Aug 1987, *J.J. de Granville et al. 9859* (NY, US); Savane de Corossony, Piste de Saint-Elie, 10 m, 05°23'N, 53°00'W, 8 Feb 1988, *M. Philippe 71* (CAY); Savane de Corossony, Piste de Saint-Elie,10 m, 05°23'N, 53°00'W, 8 Feb 1988, *M. Philippe 74* (CAY); Piste de Saint-Elie, 50 m, 05°20'N, 53°00'W, 5 Mar 1988, *M. Philippe 122* (CAY); Savane Macrabo, Région de Cayenne, 20 m, 04°47'N, 52°22'W, 8 Dec 1988, *M. Hoff 5457* (CAY); Cayenne, ca. 15 km S of on N2 Hwy, 04°48'N, 52°23'W, 2 Jul 1988, *R.M. Harley & C. Feuillet 24796* (CAY, K); Mout. des Nouragues, Bassin de l'Arataye, 4°4'N, 52°42'W, 6 May 1988, *C. Sarthou 289* (CAY, NY); Savanne Macrabo, Région de Cayenne, 20 m, 04°47'N, 52°22'W, 8 Dec 1988, *M. Hoff 5442* (CAY, NY, P); Montagne des Nouragues, Bassin de l'Arataye, Sommet, 411 m, 04°03'N, 52°42'W, 27 Apr 1988, *C. Sarthou 284* (CAY, NY); Savane Mamaribo, R.N. 1, Région littorale, 1 km à l'Est, sur la R.N. 1, 10 m, 26 May 1989, *M. Hoff & G. Cremers 5638* (CAY, NY, P, U, US); Dégrad Saramaca, Bassin du Kourou, SSW Kourou, 20 m, 9 Jun 1989, *G. Cremers & M. Hoff 10701* (B, CAY, G, MO, NY, P); Piste Risquetout, PK 8 a 10, Region de Cayenne,10 May 1990, *G. Cremers & M. Hoff 11379* (B, CAY, NY, P-2, U, US); Savane Roche de Virginie, Bassin de l'Approuague, 50 m, 11 Feb 1991, *G. Cremers & P. Petronelli 11850* (B, CAY, NY, P, U, US); Savane Roche du Quatorze Juillet, bassin du Bas-Oyapock, 50 m, 16 Apr 1991, *G. Cremers & S. Gautier 12199* (B, CAY, NY, P, U, US); Trou Caïmans, Région littorale, 20 m, 26 Oct 1991, *G. Cremers et al. 12450* (B, CAY, NY, P, U, US); Savane Yiyi, R.N. 1, Région littorale, 7 m, 05°24'N, 53°02'W, 25 Jun 1992, *D. Toriola-Marbot 284* (CAY); Savane Rocheau, Région littorale, 7 m, 05°22'N, 53°03'W, 25 Jun 1992, *D. Toriola-Marbot 302* (CAY); Digue Yiyi, Région littorale, 2 m, 05°25'N, 53°04'W, 26 May 1992, *D. Toriola-Marbot 90* (CAY); Mont Bakra, Région des Emérillons, 560 m, 14 Apr 1993, *G. Cremers & J.J. de Granville 13059* (CAY, NY, P, US); Pic Coudreau, Monts Bakra, Région des Emérillons, 03°18'N, 52°57'W, 550 m, 18 Apr 1993, *J.J. de Granville & G. Cremers 11805* (US); Inselberg Talouakem, Massif des Tumuc-Humac, 650 m, 02°29'N, 54°45'W, 9 Aug 1993, *J.J. de Granville et al. 12150* (BBS, CAY, P, US); Diamant, 24 Nov 1993, *L. Cadamuro 502; 523; 567* (CAY); Carrière Roche-Nicole, 10 Feb 1994, *L. Cadamuro 596* (CAY); Carrière Roche-Nicole, 23 Feb 1994, *L. Cadamuro 619* (CAY); Savane Karouabo 2, 05°14'42"N, 52°47'09"W, 1 Feb 1995, *L. Cadamuro & Solacroup 31* (CAY); Savane Diane 2, 05°15'02"N, 52°48'29"W, 2 Feb 1995, *L. Cadamuro & Solacroup 65* (CAY); Toucan radar, 05°12'02"N, 52°45'07"W, 3 Feb 1995, *L. Cadamuro & Solacroup108* (CAY); Savane incluse "Agami", 05°15'28"N, 52°48'37"W, 8 Mar 1995, *L. Cadamuro & Solacroup 407* (CAY); Roche Touatou, Bassin de l'Oyapock, versant sud du Mont Touatou,130 m, 18 May 1995, *G. Cremers & J.J. de Granville 13981* (CAY, NY, P, U, US); Roche Touatou, Bassin de L'Oyapock, 130 m, 02°57'N, 52°32'W, 18 May 1995, *G. Cremers & J.J. de Granville 13983* (CAY, NY, P, U, US); Savane Renner, Région littorale, 3 m, 05°20'N, 52°53'W, 18 Mar 1996, *G. Cremers & J.J. de Granville 14387* (CAY); Savane-roche Anabelle, Bassin de L'Approuague, 120 m 04°00'N, 52°16'W, 10 May 1997, *G. Cremers 15258* (CAY, NY, P); Montagnes de la Trinité, Bassin de La Mana, 300 m, 04°37'N, 53°22'W, 17 Mar 1997, *J.J. de Granville 13414* (CAY, NY, P); Mont Saint-Marcel, zone sud-est du massif, 300 m, 02°23'00"N, 53°00'20"W, 18

Jul 2002, *J.J. de Granville et al. 15284* (CAY, NY, P, US). GUYANA: Without locality, 1838, (1839 on G sheet) *R. Schomburgk 615* (BM, G-2,K, P, U, US); Without locality, 1838, *R. Schomburgk s.n.* (G); Kaieteur savanna, Sep-Oct 1881, *G.S. Jenman 1254* (K); below Kaieteur, Sep-Oct 1881, *G.S. Jenman 935* (K); Canje River, Berbice, Apr 1884, *G.S. Jenman 1895* (NY, U); Without locality, Apr 1889, *coll. ign.* (K-2); Apr 1889, *G.S. Jenman 6138* (K, NY, US); Without locality, May 1889, *coll. ign.* (K); Tumatumari Falls, Potaro River, Oct 1898, *G.S. Jenman 7476b* (U); Kara-Kara, Demerara River, 21 Feb 1910, *C.W. Anderson 565a* (K); Dutch Fort, Canje River, Berbice, Jan 1915, *Herbarium 117* (K); SE of Georgetown, head of Hoorubia Creek, East Coast Water Conservancy, 26 Nov 1919, *A.S. Hitchcock 16960* (US); Mt. Roraima, 6 Sep 1927, *G.H.H. Tate 31* (NY); Mt. Roraima, 4000 ft, 26 Oct 1927, *G.H.H. Tate 155* (NY); Mt. Roraima, stony slopes with sandy soil, Philipp camp 5200-6000 ft, 7 Nov 1927, *G.H.H. Tate 289* (K, NY); Waranama Ranch, Wiruni-Ituni savannahs, Berbice River, Sep 1929, *E.B. Martyn 83* (K, NY, U); Annai savanna, Rupununi, 46 ft, 2 Feb 1931, *Major T. Bone 343* (K); Mt. Roraima,1932, *J.G. Myers 3233* (US); Mt. Roraima, 1932, *J.S. Meyers 3233* (US); Kaieteur Falls, Potaro River, Kaietuk savanna, 1000 ft, 20 Aug 1933, Cambridge University Expedition 1933, *T.G. Tutin 506* (BM, K, U, US); Kaieteur Plateau, Potaro River, 300-400 m, 05°10'N, 59°29'W, 30 Apr 1944, *B. Maguire & D.B. Fanshawe 23098* (F, K, MO, NY, P, U, US); Sand Creek, Rupununi River, Sep 1948, *Fr. G. Wilson-Browne 164* (*Forestry Division Guyana*) (NY, U); Sand Creek, Rupununi River, Sep 1948, *Fr. G. Wilson-Browne s.n.* (K); Imbaimadai savannas, upper Mazaruni River, 550 m, 21 Oct 1951, *B. Maguire & D.B. Fanshawe 32162* (NY); Imbaimadai savanna, 550 m, 21 Oct 1951, *B. Maguire 32163b* (NY); Rupununi, Feb-Mar 1952, *Ir J.G.P. Dirven LP181* (U); Kaieteur Falls, Potaro River, Essequibo County, 17 Jan 1954, *H.S. Irwin BG-96* (US); Mahaica Savannah, 10 mi E of Atkinson Field, 20 Apr 1954, *H.S. Irwin 221* (US); Rupununi District, 6 mi. S of Lethem, 16 Apr 1956, *H.S. Irwin 675* (US); Turuk-Wau, ca. 300 ft, 7 Nov 1957, *C.D.K. Cook 118* (K, NY); Ebini Experimental Station, Berbice River, 31 Mar 1958, *S.G. Harrison 668* (K); Imbaimadai savanna, 6 Apr 1958, *V. Graham 107* (K); Waranama Ranch, Berbice River, 4 Jun 1958, *S.G. Harrison 958* (K, NY); St. Ignatius, Rupununi, 12 Jul 1958, *S.G. Harrison 1262* (K); Orinduik Falls, Ireng River, 2000 ft, 6 Aug 1958, *S.G. Harrison 1383* (K, NY); Rupununi savanna, 14 Feb 1959, *J.J. Lanjouw & W.A.E. van Donselaar 747* (U); Kaieteur summit, 300-400 m, 31 Aug 1959, *B.A. Whitton 242* (K); Kopinang Savanna, South Pakaraima Mountains, 2750 ft, 5 Sep 1961, *B. Maguire et al. 46112a* (K, NY, US); Pakaraima Mountains, Ando Savanna, Sukabi River, affluent Ireng River, 06°33'N, 57°57'W, 2400 ft, 16 Sep 1961, *B. Maguire et al. 46203a* (F, K, NY, US); Kaieteur plateau, vicinity of Kaieteur Falls and along western rim of Potaro gorge,1400 ft, 18 Feb 1962, *R.S. Cowan & T.R. Soderstrom 1883* (NY, US); Rupununi Northern Savanna, 2 mi. S of St. Ignatius, near Takutu, 350 ft, 1 Aug 1963, *R.J.A. Goodland 267* (NY, US); Rupununi Northern Savanna, Wichabai, 350 ft, 20 Aug 1963, *R.J.A. Goodland & P.F. Maycock 483* (US); St. Francis, Mahaicony River, Mar 1967, *D.H. Davis 162* (NY, P); Imbaimadai, Aug 1967, *D.H. Davis 339* (NY); Kanuku Mountains, Apr 1968, *D.H. Davis 747* (K, NY); St. Cuthbert's trail, 4.5 mi from highway, 0-25 m, 5 Jan 1969, *University of Guyana Biology 106 no. 26* (K, NY); St. Cuthbert - St. Francis trail, Demerara, 0-25 m, Jun 1970, *D.H. Davis 1999* (K); Soesdyke, Oct 1973, *A. Cooper 87* (U); St. Cuthberts Mission, 6 Sep 1976, *S.A. Mori & A. Bolten 8293* (NY); Pakaraima Mts, Kako Amerindian village, Kako River,13 Nov 1979, *P.J.M. Maas & L.Y. Th. Westra 4392* (K, MO, NY); Rupununi District, Chaakoitou, near Mountain Point, just S of Kanuku Mountains, 02°56'N, 59°40'W, 25 Oct 1979, *P.J.M. Maas & L.Y. Th. Westra 4034* (K, NY, U); Rupununi District, Manari, 22 Oct 1979, *P.J.M. Maas et al. 3742* (F, K, MO, NY, P, U); Sand Hills, W of Abary River, 4 Oct 1981, *P.J.M. Maas et al. 5504* (F, K, MO, NY, P); Kanuku Mountains, Rupununi River, Bush Mouth near Witaru Falls, 90-120 m, 8 Feb 1985, *M.J. Jansen-Jacobs et al. 40* (B, CAY, K, NY, U, US); Kaieteur Falls, vicinity of Kaieteur airstrip, 05°11'N, 59°29'W, 450 m, 8 Oct 1987, *L.P. Kvist et al. 103* (B, P, U, US); Kaieteur Falls National Park, 05°12'N, 59°29'W, 500 m, 2 Apr 1988, *W.E. Hahn et al. 4033* (B, CAY, NY, P, U, US); Kaieteur Falls National Park, 05°12'N, 59°29'W, 500 m, 2 Apr 1988, *W.E. Hahn et al. 4074* (NY, US); Southern base of Mt. Kopinang along trail from Kopinang to Orinduik, 05°00'N, 59°55'W, 500-600 m, 9 Apr 1988, *W.E. Hahn et al. 4417* (US); Karanambo to Yupukari road, 3 Sep 1988, *P.J.M.*

Maas et al. 7209 (B, CAY, F, NY, U); Rupununi River, Monkey Pond landing, SW of Mt. Makarapan, 10 Sep 1988, *P.J.M. Maas et al. 7344* (B, CAY, K, NY, U, US); Kato, 04°40'N, 59°55'W, 750 m, 11 Mar 1989, *W.H. Hahn et al. 5583* (US); South Rupununi savanna, Dadanawa, 100-02°50'N, 59°31'W, 120 m, 17 Jun 1989, *L.J. Gillespie et al. 1629* (CAY, MO, NY, US); Sand Creek Village, 3 km E of junction of Rupununi & Katawau Rivers, 1 km S of village, 03°00'N, 59°31'W, 100 m, 21 Jun 1989, *L.J. Gillespie et al. 1701* (CAY, NY, US); Gunn's, Essequibo River, 240-260 m, 2 Sep 1989, *M.J. Jansen-Jacobs et al. 1399* (CAY, F, K, MO, NY, P, U, US); Digitima Savanna, Canje River, ± 185 km from mouth of Canje River, 05°33'N, 57°40'W, 10-20 m, 30 Oct 1989, *L.J. Gillespie et al. 2525* (U, US); Sand track to St. Cuthbert's Mission, ± 5 mi. E of highway, 06°22'N, 58°08'W, 40 m, 21 Jan 1990, *T. McDowell et al. 1703* (US); Utshe camp, 0.3 km N of Utshe River, just S of forest, 05°45'N, 61°08'W, 975 m, 22 May 1990, *T. McDowell & D. Gopaul 2721* (CAY, NY, US); E of Arabaru Creek, Kobadai Savanna, 05°27'N, 60°39'W, 488-503 m, 16 Jun 1991, *T. McDowell et al. 4585* (NY, US); Pakaraima Mountains, 50 m E of Imbaimadai airstrip, 05°42'N, 60°17'W, 525 m, 31 May 1992, *B. Hoffman 2001* (CAY, NY, U, US); Annai-Karupukari Road; 45 km N of Surama village cut off (by road), Iwokrama, 04°20'N, 58°50'W, 60-70 m, 24 Apr 1992, *B. Hoffman et al. 1430* (US); Pakaraima Mountains, 0.5-1 km SE of Imbaimadai towards Partang River mouth, 05°42'N, 60°17'W, 525 m, 17 May 1992, *B. Hoffman et al. 1671* (CAY, NY, US); South Rupununi savanna, 5 km S of Aishalton along road to Marudi Mountains, 02°23'N, 59°18'W, 200 m, 9 Sep 1993, *T.W. Henkel et al. 2781* (US); Gunn's Strip savanna, 1 km W of village, 01°40'N, 58°38'W, 250 m, 18 Feb 1994, *T.W. Henkel et al. 4562* (US); Iwokrama Rainforest Reserve, 1 km N of Surama, 200 m, 20 May 1995, *C. Ehringhaus 111* (US); Iwokrama Rainforest Reserve, along Kurupukari-Annai Road, near head of A-B transect, 04°35'N, 58°44'W, 75 m, 20 Nov 1995, *H.D. Clarke 563* (US); Rupununi Northern Savanna, just W of large airstrip NW of Karanambo, 03°50'N, 59°10'W, ca. 80 m, 22 Oct 1996, *C.N. Horn & J. Wiersema 11077* (US); Iwokrama Rain Forest Reserve, Karupukari, 20 mi. SW on Karupukari/Annai Road, near camp, 04°25'N, 58°50'W, 60 m, 19 Mar 1997, *S.A. Mori et al. 24478* (US); South Rupununi Savanna, Wakadanawa Savanna, 290 m, 01°60'N, 59°34'W, 8 Sep 1997, *M.J. Jansen-Jacobs et al. 5430* (U, US); Parabara Savanna, trail from Karaudarnau to Kuyuwini River, 02°11'58"N, 59°22'14"W, 270 m, 01 Jun 1997, *H.D. Clarke 5120* (US); Parabara Savanna, trail from Karaudarnau to Kuyuwini River, 02°11'58"N, 59°22'14"W, 270 m, 01 Jun 1997, *H.D. Clarke 5088* (US); Gunn's Strip, airstrip 2 km W of village & Essequibo River, 01°39'05"N, 58°38'50"W, 240 m, 18 Sep 1998, *H.D. Clarke et al. 7883* (US). GUYANA or SURINAME:Without locality, 1843, *F.W.R. Hostmann 523* (BM, G-3,P-2,U). SURINAME: Without locality, 1830, *F.L. Splitgerber s.n.* (G); Without locality, 1841, *M. Berthoud-Coulon 52* (BM, MO, NY); Without locality, 1842-1863, *F.W.R. Hostmann s.n.* (K); Without locality, 1843, *F.W.R. Hostmann s.n.* (K); Without locality, 1846! *F.W.R. Hostmann & Kappler s.n.* (NY); Without locality, Oct 1909, *I. Boldingh s.n.* (U); Patncksavanne, 16 Apr 1910, *collector indigenous 144* (U); Apikollo, 29 Jan 1911, *J.F. Hulk 41* (U); Zanderij I, 5 Jul 1912, *J. Kuyper 76* (U); Zanderij I, Aug 1914, *E. Essed 93* (MO, P, U); Zanderij I, 28 Jul 1920, *A.A. Pulle 49* (K, NY, U); Iter secundum Surinamense, Jul-Sep 1920, [Eperoeroe Savanna], 7 Sep 1920, *A.A. Pulle 478* (U); Coesewijne Savanne, 2 May 1921, *H. Uittien 5144* (K); Coesewijne Rivier, 28 May 1921, *J.W. Gonggrijp 5144* (U); Wilhelmina Gebergte, 01 Aug 1926, *G. Stahel 573* (U); Zanderij I, 30 Jul 1933, *J. Lanjouw 333* (K, MO, NY, U); Near Brownsweg, 11 Nov 1933, *J. Lanjouw 1249* (U); Near Brownsweg, 13 Nov 1933, *J. Lanjouw 1265* (U); Boven-Sipaliwini, camp B (U sheet), fluv. Sipaliwini sup., pr. kamp B. [Sipaliwini savanna] (BM sheet), 20 Jan 1936, *H.E. Rombouts 384* (BM, U); Powakka Savanne, Suriname Rivier, 12 Sep 1936, *J. Frickers & H.J. Muller 11* (U); Zanderij I, airfield, Oct 1941, *G. Stahel 146* (NY); Zanderij Savanne II, 3 Jun 1944, *B. Maguire & G. Stahel 23669* (F, NY, U, US); Tafelberg [Table Mountain], Camp no 1, 300 m, NE of camp, 4 Aug 1944, *B. Maguire 24224* (F, K, MO, NY, U, US); near Vier Kinderen, 5 Sep 1948, *J. Lanjouw & J.C. Lindeman 179* (K, NY, U); Moengo tapoe ad Grote Zwiebelzwamp, 12 Oct 1948, *J. Lanjouw & J.C. Lindeman 788* (U); Moengo tapoe ad Grote Zwiebelzwamp, 16 Oct 1948, *J. Lanjouw & J.C. Lindeman 873* (U); Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp, 16 Oct 1948, *J. Lanjouw & J.C. Lindeman 884* (U); Via secta ab Wiawia Bank

ad Grote Zwiebelzwamp, 26 Nov 1948, *J. Lanjouw & J.C. Lindeman 1295* (U); Tibiti Savanne, 5 Jan 1949, *J. Lanjouw & J.C. Lindeman 1614* (K, NY, U); Zanderij II, 26 Feb 1949 *J. Lanjouw & J.C. Lindeman 3299* (NY, U); Savanna near railroad, near km 106 langs spoorlijn [between km 72 and Kabelstation], 22 Apr 1949, *J. Lanjouw & J.C. Lindeman 3033* (K, NY, U); Zanderij I, 6 Jul 1949, *J. Lanjouw & J.C. Lindeman 115* (K, NY, U); Moengo tapoe ad Grote Zwiebelzwamp, 22 Jul 1949, *J. Lanjouw & J.C. Lindeman 719* (U); Moengo tapoe ad Grote Zwiebelzwamp, Kleisavanne bij km 6.5, 2 Aug 1949, *J. Lanjouw & J.C. Lindeman 592* (NY, U); Tibiti Savanne, near km 0.4-0.6, 25 Aug 1949, *J. Lanjouw & J.C. Lindeman 1622* (NY, U); Pakka Pakka [Saramacca], near Ebbatop, 19 Feb 1951, *J.C. Lindeman 1610* (U); Zanderij I, 19 Mar 1951, *D.G. Geyskes 81, 88* (U); Kleisavanna aan de oostoever van de Marataka Bloem lichtgroen, bijna wit, 8 Apr 1951, *J. Florschutz & P.A. Florschutz 2004* (U); Palaime Savanne, 2 May 1952, *D.C. Geyskes s.n.* (U); Zanderij complex, 31 Jul 1952, *Ir J.G.P. Dirven LP300* (U); Matta Savanne, 28 Jul 1952, *Ir J.G.P. Dirven 279* (U); Zanderij-complex, 31 Jul 1952, *Ir J.G.P. Dirven 302* (U); Zanderij complex, 31 Jul 1952, *Ir J.G.P. Dirven LP320* (U); Kasiwinika [Cassewinica] Kreek, near Kopie, 15 Jul 1953, *J.C. Lindeman 4256* (U); Kasiwinika (Cassewinica) Kreek, near Kopie, 16 Jul 1953, *J.C. Lindeman 4410* (U); Zanderij, vliegveld, 30 Dec 1955, *A.M.E. Jonker-Verhoef & F.P. Jonker 324* (U); Zanderij, 14 Mar 1956, *J.C. Lindeman LP598* (U); Kleisavanne ten Noorden van Berlijn, 28 May 1956, *P.C. Heyligers 54* (U); Upper Coppename Rivier, near foot of Volzberg, 24 Sep 1956, *J.P. Schulz 7828a* (U); Prope Jodensavanne (fluv. Suriname), 5 Jun 1957, *Heyligers, P.C. 793* (U); Lobin-savanna inter Zanderij I and Hannover, Aug 1958, *J. van Donselaar & W.A.E. van Donselaar 396, 397a* (U); Lobin-savanna inter Zanderij I & Hannover, 22 Jan 1959, *J. van Donselaar & W.A.E van Donselaar 451b* (NY); Lobin-savanna inter Zanderij I and Hannover, 29 Apr 1959, *W.A.E. van Donselaar DC6* (U); Zanderij I, natte witzandsavanne, 30 Apr 1959, *W.A.E van t.B.H. Donselaar DC9* (U); 8 km WSW of Maboega [Tapanahony], Aug 1959, *J.P. Schulz 8225* (U); Matta, 15 km in dir. occid. a Zanderij, 27 Nov 1960, *K.U. Kramer & W.H.A. Hekking 2243* (C, U); Tafelberg, 300 m, 19 Feb 1961, *K.U. Kramer & W.H.A. Hekking 2944* (U); Kayserberg-airstrip aan de Zuidrivier, 03°12'N, 56°30'W, 22 Feb 1961, *K.U. Kramer & W.H.A. Hekking 2995* (K, NY, U); Zanderij, 11 Jun 1961, *W.H.A. Hekking 859* (U); Kayser Gebergte Airstrip, south central Suriname, 45 km above confluence with Lucie Rivier, 2 Dec 1961, *R. Freund & S. Freund 3b* (NY, US); Jodensavanne-Mapane Kreek area [Suriname Rivier], Aug 1962, *J.H.A. Boerboom 9554* (U); Brownsweg, by railroad km 116, 14 Feb 1963, *J.G. Wessels Boer 672* (U); Lucie Rivier en Wilhelmina Gebergte, 6 Aug 1963, *Schulz, J.P. 10342* (U); savanna 2 km van Bo.Lucie Rivier langs lijn naar Wilhelmina Gebergte, 9 Aug 1963, *J.P. Schulz 10356* (U); Zuid Rivier, 11 Aug 1963, *J.P. Schulz 10391* (U); Kappel Savanne near S base of the Tafelberg, 9 Jun 1963, *J.G. Wessels Boer 1526* (C, U); Wilhelmina Gebergte, Zuid Rivier, along airstrip (Kayser), 25 km above confluence with Lucie Rivier, 270 m, 03°29'N, 56°49'W, 01 Jul 1963, *B. Maguire et al. 53959* (G, K, NY, P, U); Oost Rivier, near, 2 km NE of island, 225 m, 15 Jul 1963, *B. Maguire et al. 54171* (NY); W-oever van Maratahha by Saparra Kreek, 8 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3211* (U); W-oever van Maratahha by Saparra Kreek, 28 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3212* (U); W-oever van Maratahha by Saparra Kreek, 10 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3247* (U); 7 km W of Kourou, 29 Sep 1965, *J. van Donselaar 2593* (U); 4 km E of Brownsweg, 8 Jan 1966, *J. van Donselaar 2972* (F, U); Sipaliwini Savanne, 24 Aug 1966, *J. van Donselaar 3530* (U); Natuurreservaat Brinkheuvel [Brinkhill Nature Reserve]; sabanpasi-savanne-complex, 30 Aug 1967, *P.A. Teunissen & J.T. Wildschut 11514* (U); sabanpasi-savanne-complex, 31 Aug 1967, *P.A. Teunissen & J.T. Wildschut 11524* (U); Natuurreservaat Brinkheuvel [Brinkhill Nature Reserve]; Natuurreservaat Brinkheuvel [Brinkhill Nature Reserve]; sabanpasi-savanne-complex, 31 Aug 1967, *J.T. Wildschut & P.A. Teunissen 11524* (US); sabanpasi-savanne-complex, 2 Sep 1967, *J.T. Wildschut & P.A. Teunissen 11580* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 26 Sep 1967, *P.A. Teunissen & J.T. Wildschut 11801* (U); Sipaliwini Savanne area on Brazilian frontier, 16 Sep 1968, *F.H.F. Oldenburger et al. ON108* (U); Sipaliwini Savanne area on Brazilian frontier, 305 m, 25 Nov 1968, *F.H.F. Oldenburger et al. 171* (U); Sipaliwini Savanne area on Brazilian frontier, 30 Dec 1968, *F.H.F. Oldenburger et al. 702* (U);

Sipaliwini Savanne area on Brazilian frontier, between S camp II & Ultima Sur, 300 m, 27 Jan 1970, *F.H.F. Oldenburger et al. 1057* (U); Sipaliwini Savanne area on Brazilian frontier, S of airstrip, Feb 1970, *F.H.F. Oldenburger et al. 1321* (U); Zanderij, behind airport, 24 Mar 1976, *R. Jansma LBB 15568* (U); vicinity of Zanderij, 45-50 km S of Paramaribo, 18 Sep 1976, *S.A. Mori et al. 8319* (NY, U); Coesewijne Savanne, 31 Mar 1976, *P.A. Teunissen LBB15496* (U); Road to Hanover, 2 km E of Paramaribo-airport road, 29 Sep 1979, *W.W. Thomas 2393* (NY); Road to Hanover, 2.5 km E of Paramaribo-airport road, 29 Sep 1979, *W.W. Thomas 2388* (NY); Natuurreservaat Brinkheuvel [Brinkhill Nature Reserve], road to Hanover, 2.5 km E of Paramaribo-airport road, 29 Sep 1979, *W.W. Thomas 2387* (NY); Exp. farm Coebiti, 19 Jul 1984, *A.P. Everaarts 1062* (U); Exp. farm Coebiti, 14 Jun 1984, *A.P. Everaarts 947* (U); Exp. farm Coebiti, 14 Jun 1984, *A.P. Everaarts 941* (U); Zanderij, near J. Starke Opleidingscentrum, 3 Apr 1986, *H. Viane 1179* (MO); Tumuc Humac Mountains, Talouakem, 02°27'N, 54°48'W, 670 m, 31 Jul 1993, *P. Acevedo-Rdgz. et al. 5806* (CAY, NY, US); Inselberg Talouakem, Massif des Tumuc-Humac, 02°29'N, 54°45'W, 9 Aug 1993, *J.J. de Granville et al. 12150* (US).

12. Rhynchospora bolivarana Steyerm., Fieldiana, Bot. 28: 40. 1951. TYPE: Venezuela; Bolivar, *Steyermark 60206* (holotype: F; isotypes: NY!, US!). Figs. 10, 11, 63A-B.

Rhizomatous perennial, 18-45 cm tall, with short, nodose, fibrous rhizomes, bearing hard, knot-like remnants of old culm bases and often fibrous remnants of old leaf sheaths; roots medium-sized, 0.3-1.5 mm in diam., brown; sheathing base of culm 3-6 mm wide. Culms ascending to

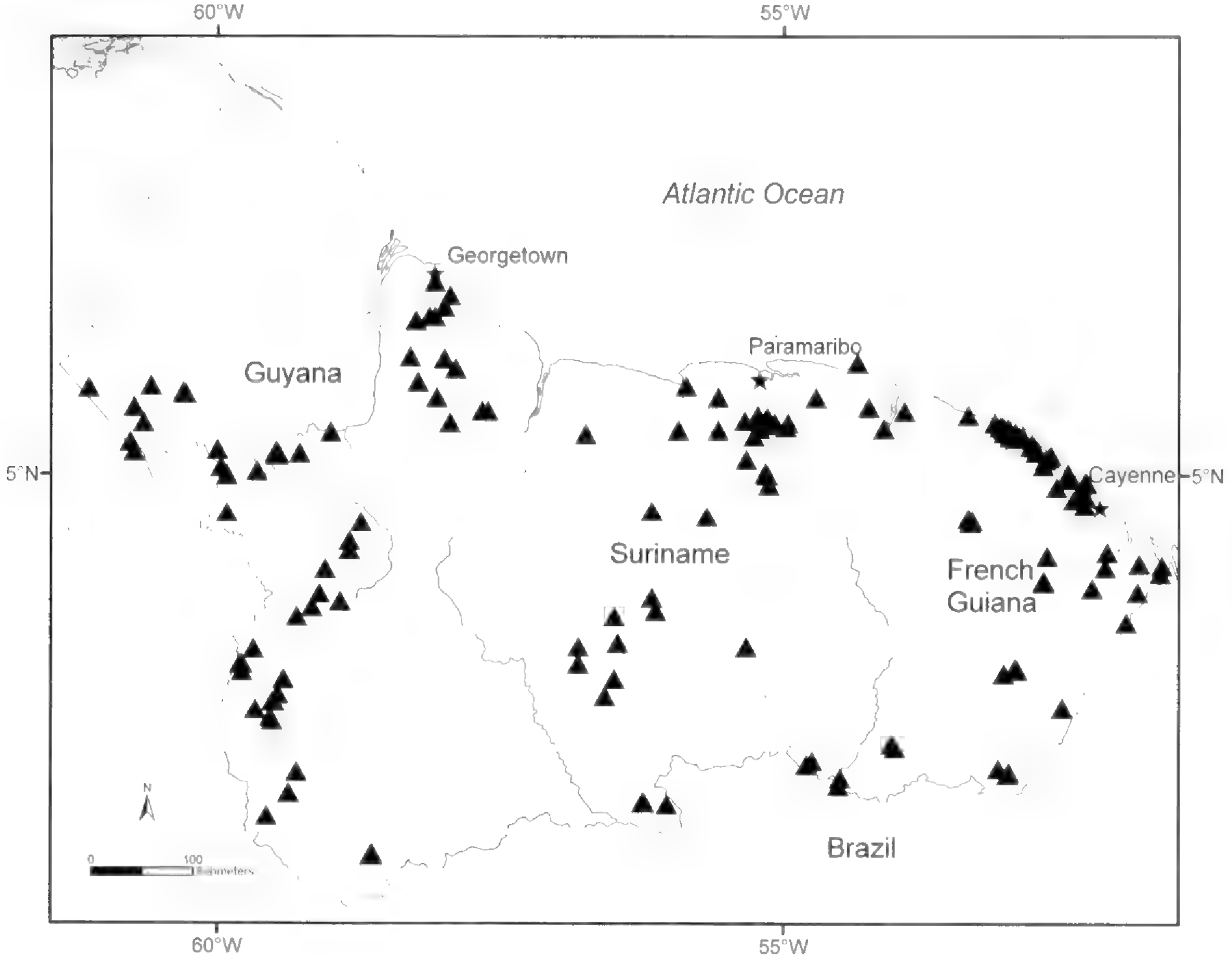

Fig. 9. Distribution of *Rhynchospora barbata* in the Guianas.

somewhat arched at maturity, 0.6-1.5 mm wide, trigonous to obtusely trigonous or compressed trigonous distally, channeled along one side distally, hard, finely ribbed, green, glabrous. Leaves numerous, basal, the cauline ones (sheathing inflorescence bracts) subtending partial inflorescence panicles, 11-55 cm long; sheaths short, eligulate, substiffened, finely veined, pale brown, glabrous, the inner band membranous, reddish brown to dark brown or brownish black, purple-dotted, with a truncate to slightly convex orifice; blades narrowly linear, (1.1-) 1.5-3.5 mm wide,V-shaped to flattened or the margins slightly involute, finely veined, smooth both adaxially and abaxially, herbaceous, green, glabrous, long-acuminate to triquetrous apex and very fine tip, margins antrorsely scabrous, the midvein abaxially remotely scabrous to smooth. Inflorescence a terminal and 1 or 2 lateral remote to subcontiguous corymbiform partial panicles from the upper leaf-like bracts; bracts reduced distally, exceeding subtending partial panicles; partial panicles 14-20 × 7-22 mm; branches short, trigonous to flattened-trigonous or crescentiform in cross section, antrorsely scabrous on margins; spikelets narrowly lanceoloid-ellipsoid, 3-7 per partial panicle, acuminate at apex, cuneate at base, 8-10 (-11) × 1.2-1.8 (-2) mm, spreading with maturing achenes; scales 14-17 per spikelet, thin, herbaceous, broadly obtuse or broadly rounded in cross section, smooth, semi-glossy, uniformly light brown, faintly reddish lineolate, margins entire, scarious, apex acute to acuminate on uppermost scales of spikelet, midcosta very fine, greenish, prolonged as a short, antrorsely scabrous mucro on lower fertile scales, not prolonged beyond apex on distal fertile scales of spikelets; fertile scales 9-12, oblong ovate-elliptic to lanceolate, the terminal scale of spikelet linear-lanceolate, less than 1 mm wide, (5-) 5.4-6.6 × 0.6-2.5 (-2.8) mm; sterile scales 5, ovate to narrowly ovate or ovate-elliptic to oblong ovate-elliptic, with short, antrorsely scabrous awn, 1.1-4.5 (-5) × 1-2.6 mm. Stamens 3, the anthers 1.8-2.2 mm long, with lanceolate-subulate or apiculate apex, bi-lobed at base; style 2-branched, the branches to as long as or slightly longer or shorter than unbranched portion of style, equaling or slightly longer than bristles, both exserted beyond apex of mature fertile scale. Achenes biconvex, narrowly obovate to narrowly obpyriform or narrowly oblong-obpyriform, 2.1-2.6 mm long (including stipitate base), 0.8-1 mm wide, finely cellular-reticulate to essentially smooth, shiny, light brown to brown, inconspicuously jointed above the slenderly attenuate, long-stipitate, stramineous to pale brown base (lighter in color than achene), the apex obtuse to subtruncate; epidermal cells irregular, somewhat isodiametric, often quadrate or subrectangular and vertically oriented; style base triangular to narrowly triangular, 1-1.5 mm long, 0.5-0.7 mm wide at base, soft and brittle, brown to dark brown or brownish black; bristles 6, subulate, antrorsely barbed, light brown to reddish brown, 5-7.5 mm long, overtopping achene and apex of style base, the longer ones exceeding apex of fertile scales.

Distribution: Endemic to the Guayana Shield (Venezuela and Guyana).

Habitat in the Guianas: Along rocky creeks, streambanks, and waterfalls in forest; rocky upland savanna, white sand savanna, 650-1120 m.

Specimens examined: GUYANA: Mt. Roraima, ca. 7.5 mi NNW of N "prow", 1700 ft, 05°21'30"N, 60°46'00"W, 1 Apr 1978, *P.J. Edwards 174* (K); Pakaraima Mountains, basecamp 8.6 km NE Imbaimadai on Partang River tributary, 05°46'N, 60°15'W, 650 m, 21 May 1992, *B. Hoffman et al. 1788* (B, CAY, NY, P, U, US); 11 km W Paruima, between Ararata scrub area and Waukauyengtipu, 05°49'36"N, 61°09'19"W, 850 m, 7 Jul 1997, *H.D. Clarke et al. 5472* (US); Mt. Ayanganna, east face, camp at base of second of four escarpments, 1120 m, 16 05°22'22"N, 59°57'34"W, Jun 2001, *H.D. Clarke et al. 9234* (US).

13. Rhynchospora brachychaeta C. Wright in Sauvalle, Anales Acad. Ci. Méd. Habana 8: 85.1871. TYPE: Cuba; Pinar del Rio, *C. Wright 3782*, (holotype: GH; isotypes: NY!, US!). Figs. 12, 68C-D.

Rhynchospora blauneri Britton, Bull. Torrey Bot. Club 50: 56. 1923. TYPE: Puerto Rico; Sierra de Luquillo, 1852-53, *Blauner 247* (holotype: NY!).

Rhizomatous perennial, 10-40 cm tall; rhizome short, creeping, the culms spaced at intervals along the rhizome; roots fine; sheathing base of culm 3-5 mm wide. Culms ascending, 3-5 mm wide, filiform, obtusely trigonous to subterete, finely ribbed, firm, glabrous, green. Leaves 2-4 (per culm), linear-filiform, 10-20 cm long; sheaths eligulate, finely ribbed, green, glabrous, the inner band membranous, reddish, with a truncate to

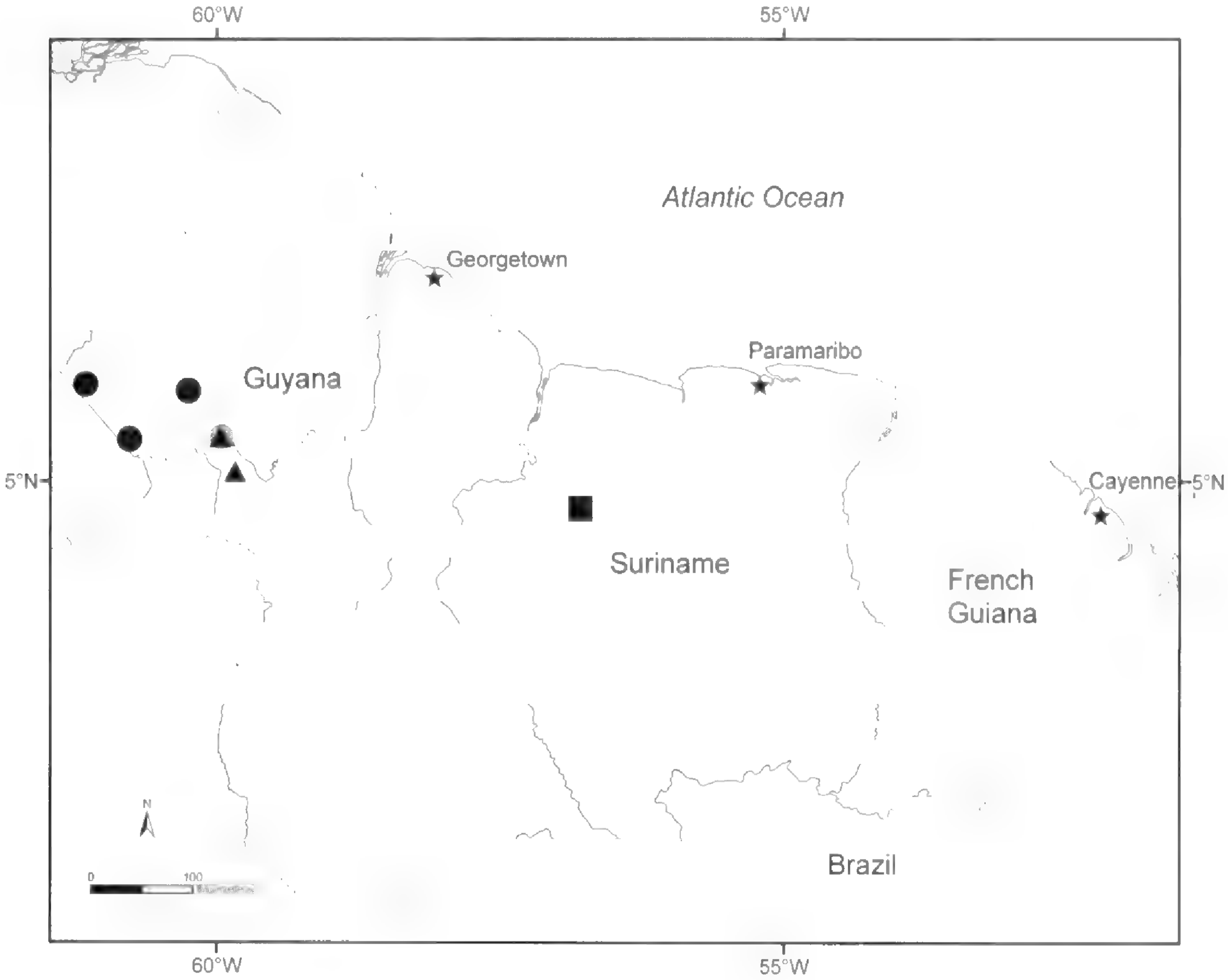

Fig. 10. Distribution of ▲*Rhynchospora ayangannensis*; ■*R. bakhuisensis*; and ●*R. bolivarana* in the Guianas.

concave orifice; blades 3-5 mm wide, involute, capillary, crescentiform-capillary proximally, flattened and antrorsely scabrous on margins distally, green, glabrous, acuminate to apex. Inflorescence a terminal and 1 or 2 lateral, small, obtriangular or narrowly elliptic partial panicles of fasicicled spikelets from the upper leaf-like bracts; panicles 6-10 × 4-10 mm; peduncles and panicle branches crescentiform-capillary, scabrous on the margins, finely ribbed, green, glabrous; spikelets narrowly ovoid-lanceoloid with acuminate apex, cuneate at base, 3-3.2 × (0.6-) 0.7-1.2 mm, 10-25 per partial panicle; scales 3 or 4 per spikelet, ovate, dorsally broadly obtuse to rounded in cross section, brown, glabrous, with a single pale narrow midcosta prolonged beyond apex as a 0.2-0.3 mm long mucro, lateral veins indistinct, margins entire, inrolled in fertile scales, the apex acuminate; fertile scale 1, 2.1-3 × 1.9-2.2 mm, clawed at base, inrolled around flower and developing achene; sterile scales 2 or 3, 1.3-2.3 × 0.5-1.2 mm. Stamens 3, or sometimes 1 or 2 abortive, the anthers 1.3-2 mm long, apiculate at apex, truncate with minute papillae at base; style 2-branched, the branches about as along as unbranched portion, exserted from fertile scale, glabrous. Achene biconvex with bulging center, obovate, 1.2-1.4 × 1-1.1 mm, faintly cellular-reticulate and brownish on sides, the turgid center smooth, light brown to yellowish brown; epidermal cells isodiametric, no central nodules evident; style base triangular to narrowly triangular, 0.5-0.7 mm long, 0.5-0.7 mm wide at base, pale brown; bristles 1-4, short to rudimentary, antrorsely barbed.

Distribution: Central America (Belize and Nicaragua), Greater Antilles (Cuba and Hispaniola), and Guyana.

Habitat in the Guianas: Known only from a

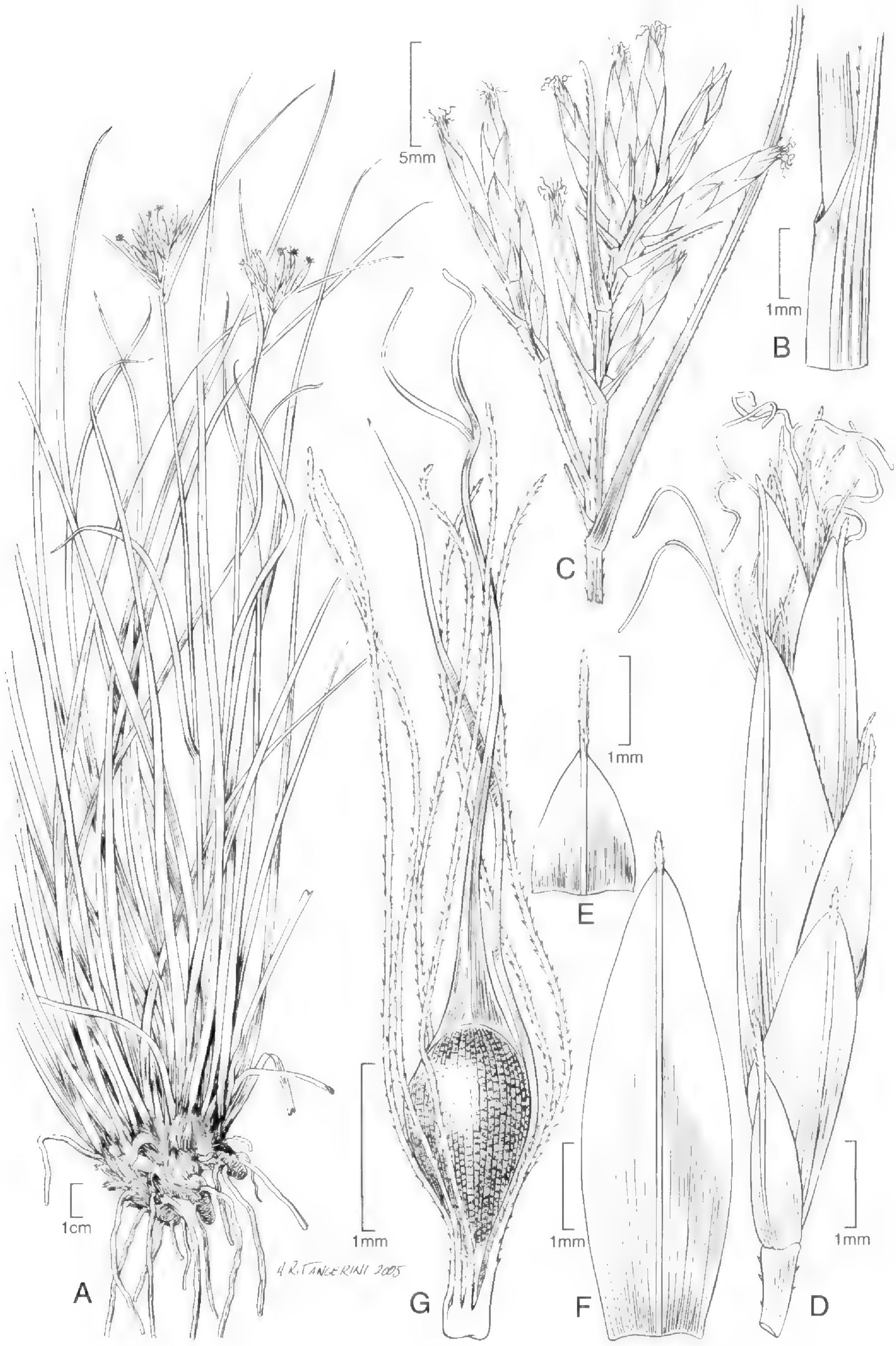

Fig. 11. *Rhynchospora bolivarana*. A. Habit. B. Section of culm showing junction of leaf sheath and blade. C. Inflorescence. D. Spikelet. E. Lower sterile spikelet scale. F. Fertile spikelet scale. G. Achene. (A, from *Clarke 5472* and *9234*, US; B-G, from *Clarke 9234*, US).

single collection in Guyana; in a steep area in savanna adjacent to a small stream.

Specimens examined: GUYANA: Utshi R. trail to Santa Elena, Venezuela, 05°39'38"N, 61°09'43"W, 980 m, 31 Jan 1996, *H.D. Clarke 923* (US).

14. Rhynchospora brasiliensis Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn. 41/42: 26. (1879/80) [1880]. TYPE: Brazil; Rio de Janeiro, *Glaziou 7990* (holotype: B, destroyed, photo US ex B; isotypes: G!, P-2). Figs. 12, 66A-B.

Rhizomatous perennial, 27-102 cm tall; rhizome short, ascending to horizontal; roots medium to coarse, dark brown; sheathing base of culm 4-8 mm wide. Culms ascending to erect, (1-) 1.3-2.3 (-2.8) mm wide, obtusely trigonous to trigonous, coarsely and finely ribbed, channeled along one side distally, antrorsely scabridulous to inconspicuously so, at least distally, pale green to green, glabrous. Leaves 7-10, erect to ascending, primarily basal, 3 or 4 cauline, often with several bladeless sheaths at base, 5-50 cm long; sheaths eligulate, basal ones tight, cauline ones subloose, herbaceous to thickly herbaceous, finely and closely veined, substramineous, pale brown to brown proximally, glabrous, the inner band membranous and reddish brown on basal sheaths, herbaceous with only a membranous orifice on distal sheaths, with a truncate to slightly concave orifice; blades linear, (1.2-) 1.4-4.7 mm wide, V-shaped proximally to recurved-plicate distally, herbaceous to thickly so, dull and finely veined abaxially, smooth, semi-glossy, and minutely cellular-reticulate adaxially, pale green, glabrous, margins scabrous to smooth, attenuate to triquetrous apex. Inflorescence a series of 2-3 (-4) corymbose-fasciculate partial panicles of spikelets from the upper leaf-like bracts; terminal panicles 16-70 × 8-25 (-35) mm, with 24-220 spikelets; bracts reduced distally, often shorter than subtending panicles; peduncles ascending, half-round or subfiliform and channeled, 2-7 cm long, those on the lowermost panicles elongating to 10 cm and curving; branches short, half-round or subterete; spikelets ovoid-ellipsoid to ovoid-lanceoloid, 4-6.5 (-7) × 0.7-1.5 mm, obtuse at base, acuminate at apex; scales obtuse to rounded in cross section, submembranous and subtranslucent, finely cellular-striate, reddish brown and often dark brown on sides, glabrous, margins erose, very narrowly scarious, midcosta fine, pale green, prolonged beyond the acuminate apex as a sharp-tipped antrorsely scabrous mucro; fertile scales 3-6, ovate-elliptic to ovate-lanceolate, 1.7-4.5 × 1.2-2.4 mm; sterile scales ovate-elliptic, 0.5-2.2 × 0.7-1.1 mm. Stamens 2 or 3, the anthers 0.9-2.3 mm long, apiculate at apex, truncate and minutely lobed at base; style 2-branched, as long as or 1/3 longer than unbranched portion, long-exserted beyond apex of subtending scale. Achene biconvex, linear-obovate, 1.6-2.3 mm long (including stipe), 0.6-1 mm wide, transversely rugulose, glossy, short-cuneate to stipitate base, rounded to subtruncate at apex, light brown to dark brown, margins wire-like and pale, lighter colored than achene sides; epidermal cells linear, vertically oriented; style base lanceolate, 1-1.8 mm long, 0.5-0.7 mm wide at base, flattened and brittle, pale brown to brown; bristles 6, linear-filiform, flattened proximally, straight at anthesis, curving or curling with age, finely antrorsely spinulose, reddish, exceeding achene and tip of style base.

Distribution: South America (Colombia, Venezuela, Guyana, and Brazil).

Habitat in the Guianas: Known only from a single collection made in Haieka savanna near Mt. Ayanganna, Pakaraima Mountains, Guyana.

Specimens examined: GUYANA: Mt. Ayanganna; Haieka savanna east side of river, 21 Aug 1960, *S.S. Tillett & C.L. Tillett 45211* (NY).

15. Rhynchospora brevirostris Griseb., Cat. Pl. Cub. 246. 1866. TYPE: Cuba, C. *Wright 3410* (holotype: probably at GOET; isotype: GH!, P-2). Figs. 12, 81A-B.

Rhynchospora clarkei Rose, Contr. U.S. Natl. Herb. 10: 464. 1908. *Rhynchospora pringlei* C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 89. 1908, non Greenman, 1903; *Rhynchospora brevirostris* var. *clarkei* (Rose) Kük., Bot. Jahrb. Syst. 75: 287. 1951. LECTOTYPE: Mexico; Jalisco, *Pringle 2319* (K; isolectotype: NY), designated by T. Koyama, Mem. New York Bot. Gard. 23: 31. 1972.

Rhynchospora brevirostris var. *truncata* Kük., Bot. Jahrb. Syst. 75: 287. 1951. TYPE: Brazil; Para, Maruay, *Von Luetzelburg 21158* (holotype: M).

Annual, 2-22 cm tall; roots fine to medium; sheathing base of culm 0.3-1 mm wide. Culms caespitose, erect, 0.3-0.5 mm wide, filiform,

compressed-trigonous, channeled along one side distally, flexuous, finely ribbed, green, glabrous. Leaves ascending, 1 or 2, basal, most bracteal, 0.4-10 (-15) cm long; sheaths eligulate or with a faint rim of tissue at adaxial junction of sheath and blade, herbaceous, inner band membranous distally, light brown to reddish brown, the orifice truncate; blades 0.6-1.7 mm wide, linear-filiform, V-shaped to subflattened proximally, subinvolute distally, finely veined abaxially, cellular-reticulate adaxially, attenuate to triquetrous apex. Inflorescence a terminal and 1-3 lateral small lax short-pedunculate corymbose panicles of 1-7 spikelets from the cauline bracts, the terminal 5-12 (-20) mm in diam.; bracts elongate, leaf-like, ascending, often curving or spiraling with age, greatly overtopping subtending panicle; spikelets solitary or paired, ovoid-lanceoloid, 2.6-4 × 0.8-1.4 mm, subterete, cuneate at base, acute to acuminate at apex, the scales widely spreading with maturing achenes; scales 7-9 per spikelet, obtuse to rounded dorsally, acute to obtuse at apex, margins broadly scarious, lower sterile and fertile scales thickly herbaceous to subcoriaceous, spreading, smoothish, light brown proximally to yellow-brown on sides distally, upper fertile scales membranous, inrolled, rufescent, the midcosta fine, indistinct proximally, prolonged beyond the obtuse apex as a short antrorsely spinulose awn on lower sterile and fertile scales, muncronate on upper fertile ones; fertile scales 5 or 6, ovate to ovate-elliptic, 2-3 × 1-2 mm; sterile scales 2 or 3, 1.5-2 × 0.5-1 mm. Stamens 2, the anthers 0.5-0.8 (-1) mm long, apiculate at apex, rounded at base; style 2-branched ½ its length. Achene thickly biconvex, rounded-obovate, (1-) 1.2-1.6 × (0.8-) 1-1.4 mm, with a shortly prolonged truncate apex which forms a thin rim surrounding the style base, truncate at base, short-stipitate with a narrow thickend tongue-like stipe, smooth and lustrous with two cellular swellings on either side at base, brownish at base and apex, often with a grey-colored longitudinal band medially; epidermal cells rectangular, vertically oriented; style base obtusely conic, 0.2-0.3 × 0.3-0.5 mm, brown to blackish; bristles absent.

Distribution: Mexico, Central America (Honduras, Nicaragua, Costa Rica, and Panama) Greater Antilles (Cuba and Hispaniola), Trinidad, northern South America (Guyana, Suriname, French Guiana, Venezuela, Brazil, and Bolivia), and west tropical Africa.

Habitat in the Guianas: Savanna habitats, 80-300 m.

Specimens examined: FRENCH GUIANA: Savane Matiti, 32 km WNW du bac de Macouria, à l'W de Cayenne, lieu-dit "la Briquetterie", 18 Mar 1976, *Raynal-Roques 18668* (P). GUYANA: Dadanawa, Rupununi,1934, *H.P.C. Melville 61* (K). SURINAME: Sipaliwini Savanne, 26 Aug 1966, *J. van Donselaar 3604* (U); Sipaliwini Savanne area on the Brazilian frontier, East Sipaliwini Savanne at N foot of "4-Gebroeders" Mountains, 300 m, 12 Sep 1968, *F.H.F. Oldenburger et al. 86* (U-2).

16. Rhynchospora cajennensis Boeck., Linnaea 38: 404. 1874. TYPE: French Guiana; Cayenne, *K. de Jelski s.n.* (holotype: B, destroyed, photo US ex B; isotype: WA). Figs. 13, 78A-B.

Holoschoenus elatior Nees, J. Bot. (Hooker) 2: 394. 1840, non *Rhynchospora elatior* Kunth, Enum. Pl. 2: 289. 1837. *Rhynchospora demerarensis* C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 40. 1908. *Rhynchospora stricta* var. *demerarensis* (C. B. Clarke) Kük., Bot. Jahrb. Syst. 75: 194. 1950. TYPE: Guyana, *Schomburgk 760* (holotype: CGE; isotypes: BM-2!,G!, K-2!, P-2).

Rhizomatous perennial, 40-100 cm tall; rhizome short; roots medium, 0.5-1 mm thick; sheathing base of culm 5-12 mm wide. Culms erect to slightly ascending, 1.3-3.8 mm wide, obtusely trigonous, channeled along one side distally, firm but flexuous, coarsely and finely ribbed, green to yellow green or golden brown, glabrous. Leaves ascending, 8-14, 14-42 cm long, basal and cauline, subdistichous at base; sheaths eligulate, herbaceous to thickly herbaceous, finely veined and very finely cellular-reticulate abaxially, the cross-walls often more prominent and darker in color giving the surface a finely rugulose appearance, blue-green, glabrous, often strongly whitened adaxially, inner band membranous in a narrow band, soon splitting with developing culm, the orifice deeply U-shaped; blades 1.3-5.2 mm wide (flattened), narrowly linear, involute, herbaceous, finely veined and very finely cellular-rugulose-reticulate abaxially, smooth and cellular-reticulate or -bullate, frequently whitened to stramineous, glabrous, margins remotely ciliate-scabrous, attenuate to triquetrous apex. Inflorescence of 2 or 3 corymbose partial panicles from the upper leaf-like bracts, upper two often subcontiguous, lowermost remote,

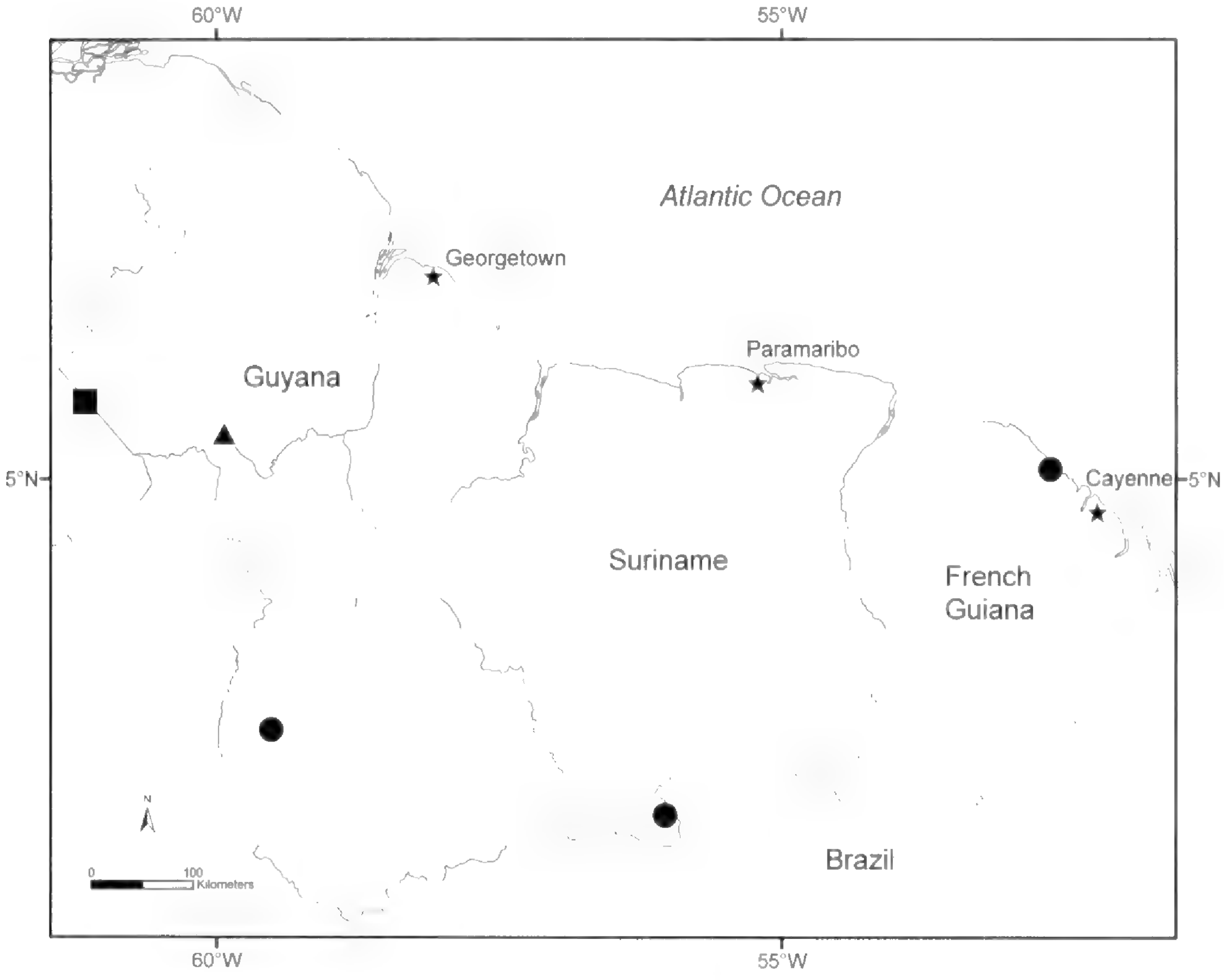

Fig. 12. Distribution of ■*Rhynchospora brachychaeta*; ▲*R. brasiliensis*; and ●*R. brevirostris* in the Guianas.

the terminal partial panicle 6-14 × 4-7.5 cm, with 16-43 spikelets; bracts shorter than to slightly overtopping subtending panicle; branches slender, obtusely trigonous to flattened-trigonous, 0.3-0.5 mm wide; mature spikelets lanceolate to elliptic-lanceolate, 7-10 (-11) × 1.5-2.7 mm, subcompressed, acuminate to narrowly acuminate at apex, cuneate at base; scales 9-45 per spikelet, sublaterally compressed, obtuse to subrounded dorsally, herbaceous to thinly herbaceous, finely striate, often very finely cellular-rugulose-reticulate on sides, dull, brown, often dark brown medially with reddish brown striations, glabrous, margins scarious, midcosta indistinct to very fine, pale proximally, extending beyond the acuminate to attenuate apex as a short, antrorsely scabrous awn; fertile scales 5-40, ovate-lanceolate to elliptic-lanceolate or lanceolate, 6.5-8.5 × 1.8-3.6 mm; sterile scales 4 or 5, lanceolate to ovate-lanceolate or widely ovate-lanceolate, 2.6-6 × 0.8-3 mm. Stamens 3 (uppermost flowers of spikelet often staminate only) the anthers 3-4.5 mm long, truncate at base, apiculate at apex; style distinctly 2-branched, the branches 1/3-½ length of style. Achenes biconvex, obovate-orbicular to suborbicular, 1.4-1.6 × 1.3-1.5 mm, rounded at both ends, yellow-brown, transversely rugulose; epidermal cells rectangular, vertically oriented; style base depressed, sublunate, 2-lobed, the lobes overlapping upper 1/3 of achene, 0.2-0.4 mm long, about as wide as achene, fuscous; bristles absent.

Distribution: Northern South America (Venezuela, Guyana, and French Guiana).

Habitat in the Guianas: Lowland savanna, 120-150 m.

Discussion: Kükenthal (1952) treated this taxon as *Rhynchospora stricta* var. *demerarensis* (C. B. Clarke) Kük.. However, C. B. Clarke, having studied both the types of *R. stricta* Boeck. (at B, but now destroyed) and *Holoschoenus elatior*

Nees, treated them as distinct. Clarke's (1908) new name for the latter, *Rhynchospora demerarensis* C. B. Clarke which was posthumously published in 1908, is preceeded by *R. cajennensis* Boeck. which was described in 1874. I am here following Clarke's conclusion that this taxon is distinct from *Rhynchospora stricta* Boeck., a plant described from Brazil (collected by *Sello*) and published a year before *R. cajennensis* Boeck. If further study shows these two taxa to be conspecific, the name *Rhynchospora stricta* Boeck. will have priority.

Specimens examined: FRENCH GUIANA: Cayenne, 16 Mar 1867, *H. Jelski 92b* (US, G-photo); Marais à env. 2.5 km à l'E de Roura (25 km S de Cayenne), 25 Feb 1978, *A. Raynal-Roques 20116* (CAY, P-2). GUYANA: Without locality, 1839, *R. Schomburgk 760* (BM-3,G, K-2, P-2); Baboon Hill, ± 1.5 km S of Sand Creek Village, 03°00'N, 59°31'W, 120-150 m, 21 Jun 1989, *L.J. Gillespie et al. 1738* (US); Foot of Mt. Shiriri, 140 m, 02°53'N, 59°43'W, 17 Jun 1995, *M.J. Jansen-Jacobs et al. 4141* (US).

17. Rhynchospora candida (Nees) Boeck., Linnaea 37: 605. 1873. *Psilocarya candida* Nees in Martius, Fl. Bras. 2(1):117. 1842. *Dichromena candida* (Nees) Ridl., Trans. Linn. Soc. London, Bot., 2: 149. 1884. TYPE: Guyana (British Guiana), *Schomburgk 685* (holotype: W; isotypes: BM!, G-2!, K!, P). Figs. 13, 79A-B.

[*Pachymitra candida* Nees in Martius, Fl. Bras. 2(1): 117. 1842, *nom. in syn.*].

Rhynchospora candida var. *pilosa* Schnee, Bol. Soc. Venez. Ci. Nat. 9(57): 62. 1943. TYPE: Venezuela; Amazonas, Puerto Ayacucho, Alto Orinoco, *Ll. Williams 13093* (holotype: VEN).

Rhizomatous perennial, 23-70 cm tall; rhizome horizontally creeping, scaly, 2-3 mm in diam.; roots medium-sized; sheathing base of culm 3-4 mm wide. Culms borne singly along rhizome at intervals, erect to arch-ascending, 0.6-1.5 (-2) mm wide, trigonous to flattened-trigonous, obtusely or acutely angled, sometimes slightly sulcate on sides, firm, finely and coarsely ribbed, green, glabrous to sparsely hirsute (at least distally). Leaves 7-10 (-20), basal and cauline, 3-26 (-30) cm long, the lower basal ones often reduced or wanting; sheaths eligulate, herbaceous, finely and closely veined, pale green, glabrous to sparsely hirsute, with a membranous inner band on lower sheaths, upper cauline sheaths membranous only at orifice, the orifice truncate on basal sheaths, U-shaped on cauline sheaths; blades narrowly linear, 1-2.5 (-3) mm wide at widest point, those near base of culm short or absent, flattened to V-shaped or folded proximally, herbaceous, green, glabrous adaxially, glabrous to sparsely hirsute abaxially, margins glabrous to often long-ciliate at base, the apex attenuate to triquetrous tip. Inflorescence a single terminal loosely congested corymbose panicle, rarely a smaller second one below, 6-40 (-53) × 6-22 (-35) mm; involucral bracts 1-3, leaf-like but reduced, the lowermost one 1-4 (-5) cm long, frequently overtopping the inflorescence, ciliate at base; panicle branches short, variable in cross section, crescentiform, flattened-trigonous, or rectangular, smooth, glabrous; mature spikelets ovoid with acute to acuminate apex, short-cuneate to obtusely narrowed at base, (1-) 2-7 (-9), (6-) 6.5-11 (-12) × 3.2-5 mm; scales 36-60 per spikelet, boat-shaped, obtusely angled to subrounded dorsally, bright white to rarely stramineous, soft, herbaceous, smooth, glabrous, midcosta inconspicuous, light green, not prolonged beyond apex of scale, or very shortly so, often darker green at tip, the apex acute to acuminate (on distal scales of spikelet); fertile scales 30-50, ovate to narrowly ovate, 4.5-5.1 × (2-) 2.3-3.8 (-4) mm; sterile scales 6-10, broadly ovate to ovate-lanceolate, 1.8-4.3 × 1.2-3.5 mm. Stamens 3, the anthers 1.5-2.2 mm long, apiculate at apex, shortly bi-lobed at base; style 2-branched, the branches as long as to ½ as long as unbranched portion, long-exserted beyond apex of subtending scale, spreading or coiling. Achene biconvex to rounded, globose to globose-obovoid, 1.1-1.4 × 1-1.3 mm, apex obtuse to rounded, base obtuse to subrounded with a spongy cellular-reticulate swelling or thickening (lobe) on either side, the lobes sometimes entire (confluent) from one side to the other, the surface transversely rugulose, yellowish white to stramineous; epidermal cells linear, vertically oriented; style base triangular-lunate, wider than achene, 1.1-1.3 mm long, 1.4-1.9 (-2) mm wide at base, spongy-thickened, stramineous to brown, decurrent along edges of achene body to about the middle; bristles absent.

Distribution: South America (Colombia, Venezuela, Guyana, Suriname, Brazil, Bolivia); West Africa.

Habitat in the Guianas: Lowland sandy or clay savanna, 80-300 m.

Distinguishing features: The species is readily distinguished by its culms arising at short intervals along a coarse, horizontally creeping rhizome and bright white spikelet scales.

Specimens examined: GUYANA: Without locality, Jun 1839, [1838 on G sheet], *R. Schomburgk 685* (BM, G, K, P); Annai savanna, Rupununi, 150 ft, 30 Dec 1960, *V. Graham 491* (K). SURINAME: Tibiti Savanne, 7 Jan 1949, *J. Lanjouw & J.C. Lindeman 1695* (K, NY); Sipaliwini Savanne area on Brazilian frontier, 4 Jan 1969, *F.H.F. Oldenburger & R. Norde 671* (U-2,NY); Welgelegen, 20 Dec 1971, *P.J.M. Maas & H. Maas 559* (NY, U, US).

18. Rhynchospora capillifolia W. W. Thomas, Brittonia 48: 484. 1996. *Rhynchospora rigidifolia* subsp. *capillacea* T. Koyama, Mem. New York Bot. Gard. 23: 63. 1972, non *Rhynchospora capillacea* Torr., 1826. TYPE: Venezuela; Bolívar, El Geñón, Auyan-tepui, en terreno semi-abierto, rocoso, 1800 m, 18 Apr 1956, *Schnee 1564* (holotype: MY). Figs. 13, 71A-B.

Caespitose perennial, 18-25 cm tall; rhizomes short; roots fibrous, light brown to brown. Culms ascending, 0.5-1 mm wide, obtusely trigonous to subterete, firm but flexuous, indistinctly veined and channeled, frequently with uneven warty surface, scabrous at apex just below involucre, green, glabrous. Leaves 4-6 per culm, basal and lower cauline, 3-20 cm long; sheaths light green to stramineous, finely veined, smooth, glabrous or sometimes short-strigose on inner margins of orifice, inner band membranous, splitting with age, with a truncate to slightly concave orifice; ligule absent; blades linear-subulate, thickened-involute, V-shaped to canaliculate in cross section, 0.8-1.6 mm wide (unfolded), glabrous abaxially, short-strigose adaxially at junction with sheath, long-acuminate to triquetrous apex, bearing an acute tip, antrorsely scabrous on margins and midvein both adaxially and abaxially, often with a warty texture, glabrous. Inflorescence a hemispherical, capitate cluster of 6-10 spikelets at the summit of the culm, 4-11 mm in diam; involucral bracts 6-8, leaf-like but reduced, the lowermost elongate, to 10 cm long, divergent to reflexed, or 1 (-2) sometimes ascending; spikelets ovoid-lanceoloid, acute to acuminate at apex, short cuneate or obtusely narrowed at base, 3.8-5 × 1-1.2 mm; scales 9-14 per spikelet, stramineous to whitened, broadly obtuse to subrounded in cross section, herbaceous, antrorsely scabrous to smooth distally, margins narrowly scarious, lateral veins indistinct, the midcosta indistinct except at apex, pale green proximally, green distally, often antrorsely scabrous, extending as a short mucro beyond the acute to obtuse apex; fertile scales 6-10, ovate to oblong-ovate, 2.3-3 × 1.5-2 mm; sterile scales 3 or 4, ovate, 1-2.2 × 0.6-1.6 mm. Stamens 2, the anthers 1-1.3 mm long, with a subulate apiculus at apex and truncate base; style 2-branched from about the middle to $^2/_3$ length of style, glabrous, the unbranched portion often contorted below the stigmas. Achenes widely oblong-obovate, unequally biconvex to somewhat plano-convex, 1-1.1 × 0.7-0.9 mm, orangish brown to brown, surface essentially smooth; epidermal cells rectangular, vertically oriented; style base narrowly triangular-lunate, 0.2-0.4 long, 0.5-0.6 mm wide at base, subconfluent with summit of achene; bristles absent.

Distribution: Endemic to the Guayana Shield (Venezuela and Guyana).

Habitat in the Guianas: Slopes of Mts. Roraima and Holitipu in the Pakaraima Mountains, 1100-2300 m.

Specimens examined: GUYANA: North slope of Mt. Roraima, 2000-2300 m, 05°16'N, 60°43'W, 14-17 Feb 1985, *J. Renz 14269* (U); Holitipu, trail between camp & airstrip & surrounding area, 05°59'19"N, 61°03'36"W, 1100 m, 7 Feb 1996, *H.D. Clarke 1059* (US).

19. Rhynchospora caracasana (Kunth) Boeck., Linnaea 37: 607. 1873. *Dichromena caracasana* Kunth, Enum. Pl. 2: 281. 1837. *Haloschoenus caracasanus* (Kunth) Nees in Martius, Fl. Bras. 2(1): 122. 1842. TYPE: Venezuela; Caracas, *Bonpland 538* (holotype: B-Willd. n.1134, fol. 1, microfiche US ex B). Figs. 13, 83C-D.

Rhynchospora andina Kük., Repert. Sp. Nov. Regni Veg. 53: 73. 1944. TYPE: Bolivia; Near Tipuani, *Buchtien 7159* (holotype: B; isotype: NY).

Caespitose perennial, 14-40 cm tall, growing in tight clumps; rhizome short, old sheaths becoming fibrillose, the base of plant clothed with rusty brown fibers; roots medium, 0.5-1 mm thick. Culms ascending, 0.3-1 mm wide, obtusely

trigonous to subterete, firm but flexuous, coarsely and finely ribbed, finely cellular-reticulate, green, often with pale green ribs, glabrous, widely channeled along one side distally, the margins of channel antrorsely scabrous, glabrescent. Leaves numerous, ascending, primarily basal, 1-3 cauline, 2-30 (-36) cm long; sheaths eligulate, short to medium, herbaceous, finely and closely veined with enlarged translucent lens-like cells between the veins at base, pale green or pale brown distally, rusty brown proximally, glabrous, inner band wide, surrounding ¾ of stem, membranous, finely veined, very finely cellular-reticulate, reddish brown, the orifice concave to truncate, often convex medially, brown or dark brown; blades often curling or wavy, very narrowly linear, 0.2-0.9 (-1.2) mm wide, appearing filiform, variable in cross section, plano-convex, crescentiform, triquetrous, or subflattened distally, herbaceous, closely veined abaxially, smooth and finely cellular-reticulate adaxially, margins antrorsely scabrous, attenuate to triquetrous apex, green with pale green veins, glabrous. Inflorescence a terminal and 1 or 2 lateral simple to compound corymose partial panicles from the upper leaf-like bracts, the lowermost partial panicle remote; bracts shorter than to slightly overtopping subtending partial panicle, 2-6 cm long; terminal panicle 1.5-5.5 × 1-6 cm, with 7-30 spikelets; panicles branches trigonous to compressed-trigonous or subterete, the central rachis finely antrorsely scabrous on margins, with thickened, shiny brown gland-like swellings at nodes; bractlets glossy brown at base, pale brown distally; spikelets narrowly ovoid-ellipsoid to ovoid-lanceoloid, 3.5-5.5 (-6) × 0.7-1.3 (-1.5) mm, acuminate at apex, narrowly acute to acuminate at base, sometimes composed of numerous tightly fascicled sterile scales, scales spreading with maturing achenes; scales 7-10 per spikelet, shallowly cymbiform but with an essentially straight or slightly curved keel, obtuse to rounded dorsally, herbaceous to thickly herbaceous proximally, thinly herbaceous to submembranous distally, orangish brown and often glossy orangish brown or brown at base, distinctly reddish brown to dark brown shiny striate-lineolate, semi glossy, glabrous, margins broadly scarious, undulate, the midcosta very fine, pale brown, extended beyond the acute apex as a 0.5-1 mm long antrorsely scabrous awn; fertile scales 4 or 5, inrolled around flowers at anthesis, ovate-elliptic, widely ovate-ellipitc, ovate-lanceolate to lanceolate (terminal scales of spikelet), 2.5-5 × 1-2.5 mm; sterile scales 3-5, oblong-ovate to ovate or broadly ovate, 1.5-2.8 (-3) × 0.5-1.8 (-2) mm. Stamens 3 (terminal scale of spikelet reduced, often staminate only), the anthers 1-2.2 mm long, apiculate at apex, truncate and minutely papillate at base; style entire or shortly bi-lobed or 2-branched at apex, sometimes obscurely so, long-exserted beyond apex of subtending scale. Achene broadly convex, turgid, broadly obovate, subrounded, obpyriform, or broadly ovate, 1.2-1.5 mm long (including stipitate base), 0.8-1.1 mm wide, rounded to a truncate apex, abruptly narrowing to a short-stipitate base, glossy, appearing polished, faintly transversely rugulose, light brown or milky grayish brown with flecks or patches of gray; epidermal cells linear, vertically oriented; style base triangular to compressed-triangular, eilliptic at base as seen from above, bilaterally compressed, blunt at apex, unlobed at base, 0.2-0.5 mm long, 0.6-0.8 mm wide at base, crustose, brittle, rusty brown; bristles absent.

Distribution: South America (Guyana, Suriname, Venezuela, and Brazil).

Habitat in the Guianas: Often on lateritic soils in gravelly or pebbly substrate; upland savanna or shrub savanna habitats, 750-1100 m.

Specimens examined: GUYANA: Orinduik, Ireng River, 2000 ft, 8 Aug 1958, *S.G. Harrison 1402, 1405* (K); Kurikabaru Airstrip, 11 Jan 1960, *S.A. Harris 83* (K-2); Orinduik, Ireng River, Apr 1968, *D.H. Davis 734* (K, NY); Kato, 04°40'N, 59°55'W, 750 m, 11 Mar 1989, *W.H. Hahn et al. 5574* (CAY, US);Utshe River, south side overlooking Guyana & Venezuela, 05°44'N, 61°10'W, 1000 m, 25 May 1990, *T. McDowell & D. Gopaul 2879a* (NY, US); Pakaraima Mountains, Upper Ireng watershed, E slope of Malakwalai-Tipu, 300 m downslope from summit, 04°48'N, 60°17'W, 1100 m,10 Jul 1994, *T.W. Henkel et al. 5537* (NY, US). SURINAME: Upper Rio Cumina, Paroe Savanne, Aug 1941, *L.J. Schmidt 153* (US); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 21 Nov 1967, *P.A. Teunissen & J.T. Wildschut 11783* (US); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 16 Jan 1968, *P.A. Teunissen & J.T. Wildschut LBB 12181* (K, NY, U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve); sabanpasi-savanne-complex, 21 Oct 1967, *P.A. Teunissen & J.Th. Wildschut LBB 11783* (U, US).

20. Rhynchospora cephalotes (L.) Vahl, Enum. Pl. 2: 237. 1805. *Scirpus cephalotes* L., Sp. Pl., ed 2, 1: 76. 1762. *Schoenus cephalotes* (L.) Rottb., Descr. Pl. Rar. 61, t. 20. 1773. *Dichromena schoenus* J. F. Macbr., Publ. Field Mus. Nat. Hist. Bot. Ser. 11: 6. 1931, *nom. nov.*, non *Dichromena cephalotes* Britton, 1888. LECTOTYPE: West Indies. (LINN 71.56), designated by C. B. Clarke, J. Linn. Soc., Bot. 30: 314. 1894. Figs. 14, 61A-B.

Rhynchospora conica Ham., Prodr. Pl. Ind. Occid. 15. 1825. TYPE: French Guiana; Cayenne, *coll. ign.* (holotype: not located, probably at P-Desv.).

Rhizomatous perennial, (15-) 30-135 (-172) cm tall; rhizome short, thickened, 3-8 mm thick, horizontally creeping; roots coarse, dark brown; sheathing base of culm 7-20 mm wide, bearing fibrous remnants of old leaf bases. Culms

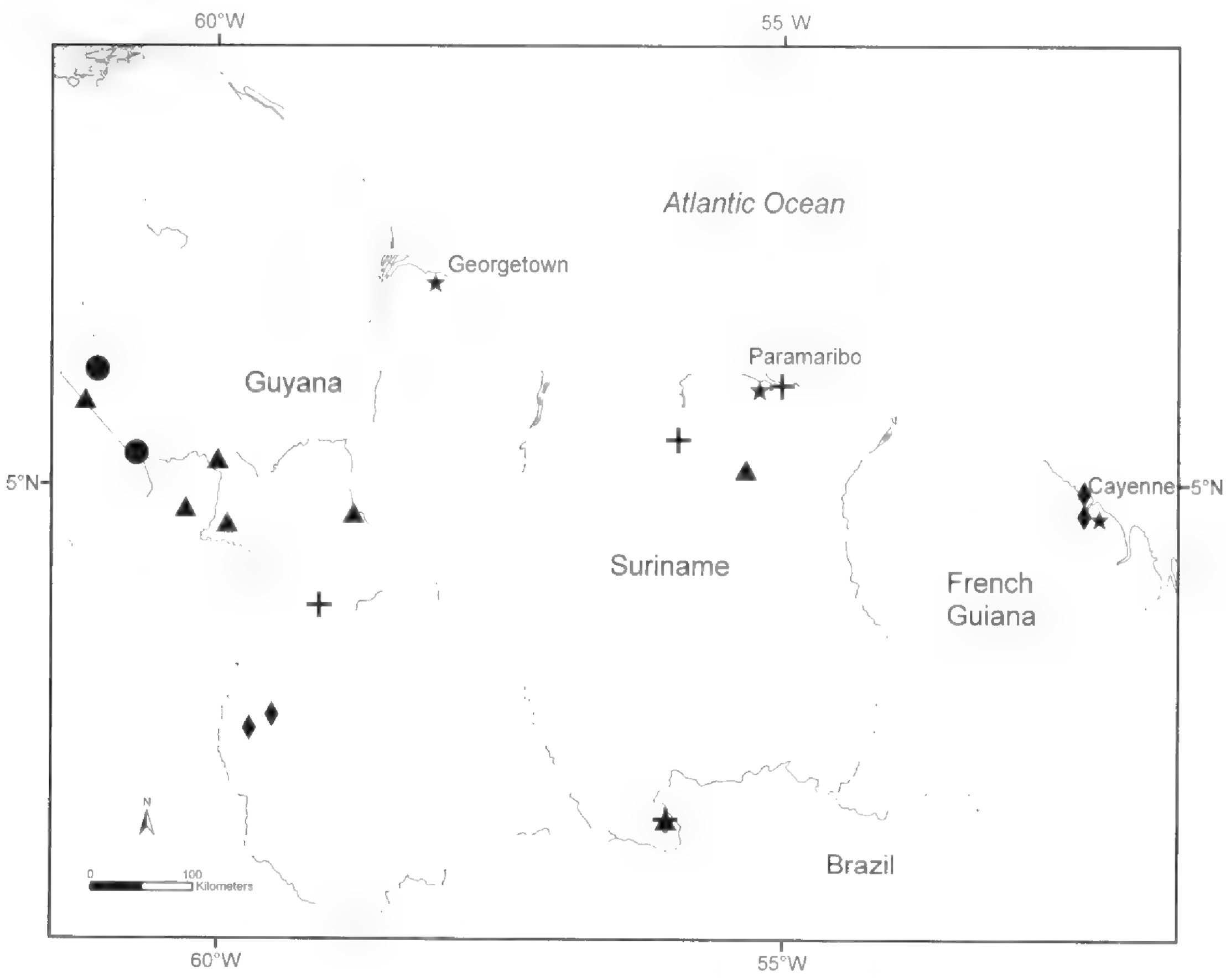

Fig. 13. Distribution of ♦*Rhynchospora cajennensis*; ✚*R. candida*; ●*R. capillifolia*; and ▲*R. caracasana* in the Guianas.

ascending, 1.5-4.5 mm wide, trigonous with obtuse to subrounded angles, firm, finely and coarsely ribbed, green, glabrous. Leaves ascending, numerous, primarily basal, 1-3 cauline, 28-150 cm long; sheaths eligulate, short, finely and coarsely veined with the veins dark green proximally, glabrous, inner band membranous and finely veined on basal sheaths, splitting with age, herbaceous and prominently veined on cauline ones, the orifice U-shaped, subthickened along margin, glabrous on basal sheaths, ciliate along margin on cauline sheaths; blades narrowly linear, (4-) 5-15 mm wide at widest point, herbaceous, flattened, minutely papillate on both sides, sometimes obscurely so, finely veined, green, glabrous except for adaxial midvein, antrorsely

scabrous along margins, ciliate-scabrous along midvein adaxially, the apex attenuate to triquetrous tip. Inflorescence a single ovoid to oblong-ovoid, pyramidal, or subglobose head-like panicle (sometimes lobate at base) of many congested spikelets at the apex of the culm, or sometimes a smaller second one below, 1.8-4.5 (-5) × 1.4-3 (-4) cm; involucral bracts 2-4 (-5), leaf-like, elongate, greatly exceeding the inflorescence, ascending at anthesis, divergent to reflexed at maturity, to 70 cm long, antrorsely scabrous distally, long-ciliate proximally near inflorescence head, pubescent adaxially proximally near base, each spikelet subtended by a linear-setaceous, ciliate-scabrous bract at base; spikelets numerous and congested in a tight head, ovoid-ellipsoid, narrowly acute at apex, short-cuneate at base, 4-6 (-6.2) × 1.1-1.6 mm, spreading to 2 mm wide with mature achenes, often forming galls; scales 11-20 per spikelet, glabrous to rarely inconspicuously pubescent on sides at apex, minutely ciliate on margins, midcosta indistinct, very narrow, dark green at apex, prolonged beyond the acute apex as a 0.5 mm long awn; fertile scales 5-8, herbaceous to submembranous, completely hidden by outer sterile scales, ovate to ovate elliptic or rounded, pale brown to brown, reddish brown lineolate, 3.2-5 × 2-3 mm; sterile scales 6-12, thickened, subcoriaceous, ovate to ovate-elliptic or rounded, 0.6-3.7 (-3.9) × (0.5-) 1-2 mm, upper sterile scales about the same size as fertile scales. Stamens 3, the anthers 1.8-2.8 mm long, bluntly apiculate at apex, truncate with minute papillae at base; style deeply 2-branched, the stigmas as long as or slightly longer than unbranched portion of style. Achene biconvex, obovate with truncate apex, (1.2-) 1.5-2.1 × (1.1-) 1.2-1.8 mm, transversely rugulose-reticulate, yellowish brown, with pale wire-like margins, quite often becoming distorted and blasted at maturity as a result of infestation by insects; epidermal cells isodiametric, no central nodules evident; style base lanceolate-attenuate, 1.8-3 (-3.5) mm long, 1.1-1.7 mm wide at base, subspongy and brittle, pale brown, reddish brown lineolate, the base slightly narrower or as wide as apex of achene; bristles 6, flattened proximally, becoming filiform distally, elongate, exceeding achene, equaling or exceeding tip of style base, 3.5-5.5 mm long, antrorsely barbed, reddish brown.

Distribution: Mexico, Central America (Guatemala, Honduras, Nicaragua, Costa Rica, and Panama), Greater Antilles (Cuba), Trinidad, and South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: Found in a diversity of lowland to upland habitats and successional habitats including, savanna, edges of bush islands, rocky hills and plateaus, granite rock outcrops, granite inselbergs in "savane roche" (rock savanna) communities, boulder fields, secondary scrub forest, cut-over tropical wet forest, riparian forest, riverine islands, mixed forest, swamp forest, creek and stream banks, seasonal ponds, sandy roadsides, and disturbed areas, 0-1000 m.

Specimens examined: FRENCH GUIANA: Cayenne, without date, *von Rohr s.n.* (BM); Cayenne, without date, *H. Jelski s.n.* (US); Cayenne, without date, *M. Perrottet s.n.* (G, P); Cayenne, without date, *J. Martin 324* (BM); Without locality, 1819-1821, *M. Poiteau s.n.* (G); Without locality, 1820, 1821, *M. Perrottet 157* (G); Without locality, 1824!, *M. Poiteau s.n.* (K); Karouany, 1856!, *P. Sagot 631* (BM, G, K, P, U); vicinity of Cayenne, 30 May 1921, *W.E. Broadway 325* (NY); vicinity of Cayenne, Grant's Road, Matabon, 19 Jun 1921, *W.E. Broadway 522* (NY); St. Madeleine Road, vicinity of Cayenne, 20 Jun 1921, *W.E. Broadway 528* (NY); L'caurent du Maroni, 5 Oct 1948, *P. Bena 4212* (*Service Forestier*) (CAY, U); Balaté Creek, 1 Dec 1948, *M. Laurent 4359* (P, U); Route de Mana (Crique Margot), 28 Apr 1950, *Service Forestier s.n.* (CAY); Savannas W of Cayenne, 26 Oct 1954, *B. Maguire & R. Cowan 38026* (NY, US); Montagne de Kaw, 220-250 m, 12 Dec 1954, *R.S. Cowan 38754* (K, NY); Cayenne, Route de Montabo, 4 Jul 1955, *J.J. Hoock s.n.* (GENT, NY, P, U, US); St. Laurent, Route de St. Jean, 23 Nov 1955, *J.J. Hoock s.n.* (P, US); Fleuve Approuague au saut Petit Japigny, 1 Aug 1968, *R.A.A. Oldeman B-1744* (CAY, P); Haute Approuague, sur la rive droite, layon de Fini Saut, 28 Sep 1968, *R.A.A. Oldeman T-190* (CAY, NY, P, U); Ile de Cayenne, lieu dit "Tour de l'Ile", 19 Aug 1969, *J.J. de Granville 274* (CAY, NY, P); Rive gauche du Grand Inini, en amont de Village Fourmi, 22 Aug 1970, *R.A.A. Oldeman B-3540* (CAY, P); Région de Cayenne, Montagne du Mahury, circuit station de pompage, Lac Remire, Lac Lalouette, Lac Rorotra, 10 Jan 1974, *B. Descoings Cl. Luu 20014* (CAY, P); Région de Cayenne, Montagne du Mahury, circuit station de pompage, Lac Remire, Lac Lalouette, Lac Rorotra, 10 Jan 1974, *B. Descoings & Cl. Luu 20112* (CAY); Région de Cayenne, route entre le

camp de Gallion et Montsinéry, bord de route, 15 Jan 1974, *B. Descoings & Cl. Luu 20188* (CAY, P); Terrain de l'IRAT, Cabassou, 1 Apr 1976, *Lescure 581* (CAY, P); 37 km NW of Kourou, 18 Nov 1976, *D. Roubik 57* (MO); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 25 Feb 1977, *G. Cremers & Y. Veyret 4344* (CAY, FTG, NY, P); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 10 Mar 1977, *G. Cremers & Y. Veyret 4412* (FTG); Haut Tamopc, Saut Awali, dans les îles du saut, 28 Mar 1977, *G. Cremers 4532* (CAY); Fleuve Mana, route de St. Laurent, près de Saut Sabat, 26 Jul 1977, *C. Sastre 5555* (P); Fleuve Approuague, Rivière Arataye, Saut Pararé, 5.5 km de fleuve, 29 Aug 1977, *C. Sastre 5799* (CAY, P); Cabassou, Ile de Cayenne, 26 Mar 1979, *M.F. Prevost 488* (CAY, P); Bord de piste Route de l'Est, km 52, 6 Apr 1979, *M.F. Prevost 499* (CAY, P); Bord de la route entre Saint-Laurent et Saint-Jean de Maroni, km II, 20 Jun 1979, *M.F. Prevost 623* (CAY, P); Tracè de Saül à Carbet Maïs, Colline granitique située a 2 km au Nord de Carbet Mitan, 500 m, 5 Jul 1979, *J.J. de Granville 3033* (CAY); Tracè de Saül à Carbet Maïs, Colline granitique située a 2 km au Nord de Carbet Mitan, 500 m, 5 Jul 1979, *J.J. de Granville 3034* (CAY); Route de tour de l'Ile de Cayenne, Piste de l'Ancien camp des Annamites, 1 Feb 1979, *G Cremers 5336* (CAY, NY, P); 12 km Est of Saül, Piste de carbet Maïs Colline boisée a 1 km Env. au Nord de Carbet Mitan, 500 m, 10 Jan 1980, *J.J. de Granville 3247* (CAY, NY, P); Sommet S du Pic Matecho [near Saül], 580 m, 21 Jan 1980, *J.J. de Granville 3343* (CAY-2, NY, P); Massif des Emerillons, zone sud, Sommet d'une colline avec blocs det affleurements granitiques, 450 m, 8 Sep 1980, *J.J. de Granville 3786* (CAY, NY, P); Massif des Emerillons, zone centrale, Affleurement granitique sur flanc de colline exposée à l'Ouest, 350 m, 12 Sep 1980, *J.J. de Granville 3838* (CAY, NY, P); Massif des Emerillons, versant nord, 20 Sep 1980, *J.J. de Granville 3936* (CAY, NY, P); Région estuaire de l'Oyapock(CAY, NY); Massif des Emerillons, zone centrale, Affleurement granitique, avec suintements au pied d'une collin, 10 Sep 1980, *J.J. de Granville 3810* (CAY, NY); Piton Rocheux Remarquable, NE face, haut de la Creek Armontabo, ouest Bas Oyapock, 300-350 m, 22 Feb 1981, *G. Cremers 7073* (CAY, NY, P); Fleuve Mana, Saut Dalles, 19 Jul 1981, *J.J. de Granville 4589* (CAY); Riv. Mana, Saut Fracas, Ilot du Saut, 23 Jul 1981, *G. Cremers 7300* (CAY, NY, P, U); Haute Riv. Mana, Saut Ananas, 13 Aug 1981, *G. Cremers 7510* (CAY, NY, P); Cayenne, route du Tour de l'Ile, PK 15, 3 Aug 1982, *A. Fournet 240* (CAY, P); SE de Cayenne, route de Regina à 1 km du pont sur la Comté, près d'une mare, 9 Aug 1982, *A. Fournet 256* (CAY, P); Route N1, près de la crique Karouabo, entre Kourou et Sinnamary, 28 Oct 1982, *F. Billet & B. Jadin 1433* (CAY); 17 km S of Saül, bords d'une creek et d'un ilet, au niveau d'un saut à environ, 4 Apr 1983, *J.J. de Granville 5499* (CAY, NY, P); Sommet du Grand Croissant, haute Crique Nouciri, affluent de l'Oyapock, N de Camopi, 320 m, 6 Dec 1983, *G. Cremers 8323* (CAY, P); Montagnes de la Trinité, Sommet Nord, 470 m, 11 Jan 1984, *J.J. de Granville et al. 5868* (CAY, U); Montagnes de la Trinité, N summit, 22 Jan 1984, *J.J. de Granville et al. 6207* (NY, U); Route de Montabo, Cayenne, 5 Mar 1985, *D.Y. Alexandre 280* (CAY, P); Montagne Bellevue de l'Inini, Zone centrale, plateau sommital, 800 m, 19 Aug 1985, *J.J. de Granville et al. 7642* (CAY, NY, P, U); Piste de Paul Isnard, 10 km SE of St. Laurent, 05°25'N, 54°00'W, 5-15 m, 17 Nov 1986, *L.E. Skog et al. 7437* (NY, US); Route de Baduel, Ile de Cayenne, Prïs de Trou Biran, 10 m, 04°56'N, 52°19'W, 9 May 1987, *M. Hoff 5126* (CAY); Camp #1, Ouman fou Langa Soula, bassin du Haut-Marouini,150 m, 14 Aug 1987, *J.J. de Granville et al. 9271* (CAY, NY, P, US); Montagne des Nouragues, Bassin de l'Arataye, 04°04'N, 52°42'W, 25 Aug 1987, *C. Feuillet 4303* (CAY, NY);Akouba Booka goo Soula, Camp #3, Roche no. 2, bassin du Haut-Marouini, 180 m, 29 Aug 1987, *J.J. de Granville et al. 9850* (P, US); Camp no 3, Roche no 2, Akouba Booka goo Soula, Bassin du Haute, Roches 2 and 3, 180 m, 02°37'N, 54°02'W, 30 Aug 1987, *J.J. de Granville et al. 9850* (B, CAY, NY, P, U, US); Monpé Soula, Bassin du Haut-Marouini, Autour du saut, 02°39'N, 54°00'W, 160 m, 6 Sep 1987, *J.J. de Granville 10091* (CAY, US); Montagne du Mahury, Ile de Cayenne, 10 m, 04°52'N, 52°15'W, 20 Jan 1988, *M. Philippe 14* (CAY); Lac des Américains, Ile de Cayenne, 50 m, 04°42'N, 52°21'W, 13 Apr 1988, *M. Philippe 283* (CAY); Montagnes des Nouragues, Bassin de l'Approuague, Arataye, 250 m, 04°30'N, 52°42'W, Jun 1989, *D. Larpin 660* (CAY); Saut Takari-Tanté, Bassin du Sinnamary, 34 m, 14 Nov 1989, *M. Hoff 5810* (B, CAY, G, K, MO, NY); Saut Kawène, Kourcibo Cr., Bassin du Sinnamary, 12 m, 04°53'N, 53°03'W, 4 Apr 1990, *M. Hoff et al. 6457* (CAY, NY); Savane Roche de

Virginie, Bassin de l'Approuague, 150 m, 04°11'N, 52°09'W, 9 Feb 1991, *G. Cremers & P. Petronelli 11710* (CAY, NY, P); Saut Vata, Bassin du Sinnamary, 7 m, 04°52'N, 52°58'W, 17 Jan 1992, *M. Hoff 7485* (CAY, NY, P); Saut L' Autel, Bassin du Sinnamary, 24 m, 04°42'N, 52°58'W, 16 Jan 1992, *M. Hoff 7534* (CAY); Saut Parasol, Bassin du Sinnamary, 65 m, 04°20'N, 52°54'W, 11 Jan 1992, *M. Hoff 7295* (NY); Saut L' Autel, Bassin du Sinnamary, 24 m, 04°42'N, 52°58'W, 16 Jan 1992, *M. Hoff 7562* (CAY); Saut Patawa, Bassin du Sinnamray,17 m, 04°46'N, 52°56'W, 17 Jan 1992, *M. Hoff 7517* (CAY); Colline de Bourda, Ile de Cayenne, 5 m, 04°56'N, 52°17'W, 4 Sep 1992, *A. LeGoff 85* (CAY); Saut Paloulou Icholi, Bassin du haut-Maroni, 150 m, 02°42'N, 54°16'W, 16 Sep 1994, *J.J. de Granville 12514* (CAY, P, U, US); Ile de Cayenne, 04.5°50'N, 52.5°20'W, 8 Jun 1994, *S. Albertini 168* (CAY); Karouabo, 01 Feb 1995, *L. Cadamuro & Solacroup18* (CAY); Carrière Roche-Dégonde, 05°18'26"N, 52°50'40"W, 22 Mar 1995, *L. Cadamuro & G. Cremers 477* (CAY); Mont Chauve, 220 m, 03°49'N, 52°44'W, 13 Apr 1997, *G. Cremers & F. Crozier 14900* (CAY, NY, P); Commune de Saint Laurent, Crique Voltaire, 120 m, 31 Jul 1998, *O.F. Poncy et al. 1093* (BBS, CAY, GENT, US); Pic Matécho, ca. 22.5 km NE of Les Eaux Claires, 03°45'N, 53°02'W, 515 m, 8 Sep 2000, *S.A. Mori & N.P. Smith 25063* (US); Monts Bakra, 1.5 km à l'Ouest du Pic Coudreau, 600 m, 18 Jun 2002, *J.J. DeGranville et al. 14860* (CAY, NY, P, US); Crique Cabassou, Ile de Cayenne, 3 m, 04°54'N, 54°18'W, 14 Aug 2002, *J.J. de Granville & F. Crozier 15627* (CAY, US); Mont Saint-Marcel, zone Sud-est du massif, 300 m, 21 Jul 2002, *J.J. DeGranville et al. 15388* (CAY, GENT, NY, P, US). GUYANA: Without locality, 1838, *R. Schomburgk 542* (BM, F, G, K, P, US); Roraima, 1842-1843 (aquired 1854 at K), *R. Schomburgk 692* (G, K, P-3); Masaruni [Mazaruni], 1867, *C.F. Appun 216* (K); Without locality, 1867, *W. Parker s.n.* (K); Gualu, Corentyne River, Sep 1879, *G.S. Jenman 215* (K); Essequibo River, Sep-Oct 1881, *G.S. Jenman 1076* (K): Upper Demerara River, Sep 1887, *G.S. Jenman 4008* (K, US); Upper Demerara River, Sep 1887, *G.S. Jenman 4112* (K); Lama, Apr 1889, *G.S. Jenman 6107* (K, NY, US); Demerara River, Jun 1894, *G.S. Jenman 6653* (K); Demerara River, Jan 1896, *G.S. Jenman 6884* (K); Tumatumari Falls, Potaro River, Oct 1898, *G.S. Jenman 7476* (K); Corentyne River, Oct 1898, *G.S. Jenman 7479* (K); Takwha, Tapakuma, Mar 1904, *G.S. Jenman 7812* (K, U); Macasseema, near, Pomeroon River, Sep 1904, *A.W. Bartlett 8034* (K); Temple Bar, Konawaruk River, Sep 1905, *A.W. Bartlett 8237* (K); Baramanni, Waini River (Short cut), Jul 1906, *J.E. Beckett 8518* (K, U); SE of Georgetown, head of Hoorubia Creek, East Coast Water Conservancy, 26 Nov 1919, *A.S. Hitchcock 16939* (NY, US); Kartabo, junction of Mazaruni and Cuyuni Rivers, 11 Dec 1919, *A.S. Hitchcock 17212* (NY, US); Rockstone, in and about the village, 15 Jul-1 Aug 1921, *H.A. Gleason 823* (K, NY, US); Upper Mazaruni River, 22 Sep 1922, *J.S. de la Cruz 2334* (F, K, MO, NY, US); Waramuri Mission, Moruka River, 23 Oct 1922, *J.S. de la Cruz 2597* (F, MO, NY, US); Mazaruni River, 4 Oct 1922, *H. Leng s.n.* (NY); Bartica, 4 Oct 1922, *H. Lang & A.C. Persaud s.n.* (F); Kamakusa, Upper Mazaruni River, 23 Nov 1922, *J.S. de la Cruz 2790* (F, MO, NY, US); Kamakusa, Upper Mazaruni River, 11-22 Jul 1923, *J.S. de la Cruz 4247* (F, MO, NY, US); Waini River, 3-18 Apr 1923, *J.S. de la Cruz 3670* (F, MO, NY, US); Macreba Falls, Kurutung River, 67 m, Aug 1925, *R.A. Altson 345* (K, U); Macreba Falls, Kurutung River, 220 ft, Aug 1925, *M. Gelson 345* (K); Waranama Ranch, Wiruni,Ituni savannahs, Berbice River, Sep 1929, *E.B. Martyn 88* (K, NY); Karanambo, Rupununi River basin, 9-13 Oct 1937, *A.C. Smith 2191* (F, G, K, MO, NY, P, U, US); Kuyuwini River Basin (Essequibo River tributary), about 150 mi. from mouth, 21-26 Nov 1937, *A.C. Smith 2575* (F, G, K, MO, NY, P, U, US); Amatuk Portage, Potaro River Gorge, 27 Apr 1944, *B. Maguire & D.B. Fanshawe 23025* (K, NY, U, US); Kaieteur Plateau, Potaro River, 9 May 1944, *B. Maguire & D.B. Fanshawe 23324* (F, K, MO, NY, U, US); Bartica, Essequibo River, 14 Nov 1945, *C.A. Persaud* (*Forestry Department British Guiana*) *5341* (K, NY, U, US); Bunawau River, Falls, Acarai Mountains, 700 ft, 29 Oct 1952, *Forestry Department British Guiana 7523* (NY); Rupununi District, 12 mi. S of Lethem, 16 Apr 1956, *H.S. Irwin 699* (US); Rupununi District, 10 mi. S of Lethem, 16 Apr 1956, H.S. Irwin 682 (US); Turuk-Wau, Rupununi, 5 Dec 1957, *C.D.K. Cook 236* (K, NY, U); Waranama Ranch, Berbice River, 22 Mar 1958, *S.G. Harrison 579* (K); Ebini Experimental Station, Berbice River, 1 Apr 1958, *S.G. Harrison 682* (K); Waranama, Intermediate savannas, Berbice River, 22 Apr 1958, *S.G. Harrison 597* (K); Waranama Ranch, Berbice River, 22 Mar 1958, *S.G. Harrison 594* (K, NY), *596* (K); Imbaimadai savanna, 6 Apr

1958, *V. Graham 119* (K); Ebini Experimental Station, Berbice River, 7 Apr 1958, *S.G. Harrison 758* (K); Waranama Ranch, Berbice River, 5 Jun 1958, *S.G. Harrison 1000* (K); Waratuk, Potaro River, 12 Aug 1958, *V. Graham 185* (K); Orinduik Falls, Ireng River, 2000 ft, 18 Sep 1958, *S.G. Harrison 1476* (K); Amatuk Falls, Potaro River, 200 ft, 24 Jul 1959, *B.A. Whitton 18* (K); Partang Rapids, 1 mi above the mouth of Partang River, 470 m, 23 Jun 1960, *B. Maguire & C.K. Maguire 45909* (NY); Kako River, 470 m, 18 Sep 1960, *S.S. Tillett & C.L. Tillett 45463* (NY); Rupununi Northern Savanna, Moka Moka Creek, 2 mi. S of village near Kanuku Mountains, 350 ft, 19 Sep 1963, *R.J.A. Goodland 828* (NY, US); Kurukabaru savanna, Pakaraima Mountains, 3000 ft, 10 Oct 1963, *J. Carrick 1043* (K); Rupununi savanna, stand 39, Yupukarri, 10 Oct 1963, *R.J.A. Goodland 952* (NY); North Rupununi, Apr 1968, *D.H. Davis 915* (K, NY); Thomas Island, Essequibo River, near Bartica, 50-125 m, 18 Aug 1976, *S.A. Mori et al. 8141* (K, NY, U); Mt. Roraima, Riverine rain forest, on E side of the Waruma river, 1700 ft, 05°21'20"N, 60°45'50"W, 31 Mar 1978, *P.J. Edwards 149* (K, NY); behind Aishalton Hospital, 18 Nov 1982, *A.L. Stoffers et al. 391* (B, CAY, K, NY, U, US); Cow savanna, along S bank of Canje River, W of Digitima Creek, 05°36'N, 57°35'W, 0-25 m, 20 Dec 1986, *J.J. Pipoly & G. Gharbarran 9501* (CAY, NY, P, US); Cow savanna, along S bank of Canje River, W of Digitima Creek, 05°36'N, 57°35'W, 0-25 m, 21 Dec 1986, *J.J. Pipoly & G. Gharbarran 9529* (NY, US); Canje River, ± 0.75 km N of Ekwarun River, 05°20'N, 57°38'W, 0-25 m, 10 Apr 1987, *J.J. Pipoly et al. 11403* (B, CAY, F, MO, NY, U, US); Canje River, Cow Savanna, E of Digitima Creek, 05°36'N, 57°35'W, 1-25 m, 12 Apr 1987, *J.J. Pipoly et al. 11440* (B, CAY, F, NY, U, US); Upper Mazaruni River region, vicinity of Kako, an Akawaio Indian village on the Kako River, 500 m, 14 Apr 1987, *B. Boom & D. Gopaul 7299* (B, NY, P, U, US); Karowtipu Mountain, S slope, upper Mazaruni River region, 460-780 m, 16 Apr 1987, *B. Boom & D. Gopaul 7353* (B, NY, U, US); Kaieteur Falls, 100-700 m upstream from the falls, 05°11'N, 59°29'W, 425 m, 7 Oct 1987, *L.P. Kvist et al. 60* (B, CAY, K, P, U, US); Kanuku Mountains, Nappi-head on Nappi creek, Camp 1, 130 m, 1 Nov 1987, *M.J. Jansen-Jacobs et al. 625* (B, CAY, F, NY, U); Kanuku Mountains, Nappi-head on Nappi Creek, Camp 1, 130 m, 3 Nov 1987, *M.J. Jansen-Jacobs et al. 679* (B, CAY, NY, P, U, US); Kaieteur Falls National Park, along trail to Johnson's view, 05°10'N, 59°29'W, 500 m, 15 Apr 1988, *W.E. Hahn et al. 4571* (NY, US); Rupununi River, Monkey Pond landing, SW of Mt. Makarapan, 11 Sep 1988, *P.J.M. Maas et al. 7368* (B, CAY, K, NY, U); Camp along Waruma River, ± 2 km upstream of confluence with Kako River, 05°20'N, 60°43'45"W, 600 m, 10 Feb 1989, *W.E. Hahn & D. Gopaul 5254* (B, NY, US); Gunn's, Essequibo River, 240-260 m, 5 Sep 1989, *M.J. Jansen-Jacobs et al. 1476* (B, CAY, MO, NY, P, U, US); Kuma, ± 15 km SE of Lethem, foot of Kanuku Mountains, 03°16'N, 59°43'W, 120-150 m, 7 Jul 1989, *L.J. Gillespie & D. Gopaul 2027* (CAY, MO, NY, U, US); Gunn's, Essequibo River, 240-260 m, 5 Sep 1989, *M.J. Jansen-Jacobs et al. 1474* (B, CAY, K, MO, NY, U, US); Digitima Savanna, Canje River, ± 20 km S of Mora, 185 km from mouth of Canje River, 05°33'N, 57°40'W, 10-20 m, 29 Oct 1989, *L.J. Gillespie et al. 2480* (CAY, NY, US); Maipuri Falls, Karowrieng River, 05°41'N, 60°14'W, 570-600 m, 20 Dec 1989, *L.J. Gillespie & D.R. Smart 2830* (CAY, MO, NY, U, US); Kato, 04°40'N, 59°55'W, 750 m, 11 Mar 1989, *W.H. Hahn et al. 5584* (CAY, NY, US); About 27 km from Ituni along Ituni, Kwakwani road, 05°22'N, 58°07'W, 30-60 m, 16 Jan 1990, *L.J. Gillespie et al. 2957* (U, US); ± 4 km NW of Surama Village, ± 10 km N of new Paranapanema Road, along western trail to Buro-Buro Rive, 04°09'N, 59°04'W, 65-90 m, 19 Feb 1990, *T. McDowell et al. 1899* (NY, US); Surama Village, NW of airstrip, 04°09'N, 59°04'W, 75-85 m, 24 Feb 1990, *T. McDowell et al. 2006* (NY, U, US); Utshe River area, along trail leading to Venezuela, 05°45'N, 61°09'W, 900-950 m, 25 May 1990, *T. McDowell & D. Gopaul 2850* (US); SE Kanuku Mts, Crabwood Creek basecamp, ± 8.5 km ENE of Makawatta Mountain, 03°07'25"N, 59°17'10"W, 200-212 m, 01 Nov 1991, *B. Hoffman & D. Gopaul 485* (CAY, NY, US); Southern Pakaraima Mountains, 17 km NW of Karasabai, mouth of Tipuru River at Ireng River, 04°09'12"N, 59°38'36"W, 150 m, 25 Feb 1992, *B. Hoffman & H. Jacobs 1034* (CAY, MO, NY, US); Pakaraima Mountains; upper Mazaruni River, 8 km S of Imbaimadai settlement, 05°38'N, 60°17'W, 525-575 m,11 Oct 1992, *B. Hoffman et al. 2889* (CAY, NY, US); Pakaraima Mountains, upper Mazaruni River, 4.5-5.5 km S of Imbaimadai settlement, 05°39'N, 60°17'W, 525-575, 11 Oct 1992, *B. Hoffman et al. 2855* (CAY, MO, NY, US);

Pakaraima Mountains, upper Mazaruni River, 8 km S of Imbaimadai settlement, 05°39'N, 60°17'W, 525-575 m, 11 Oct 1992, *B. Hoffman et al. 2870a* (US); Radius of 0.5 km around Goldmine settlement, 06°32'N, 58°37'W, 0-15 m, 20 Dec 1992, *T.W. Henkel & M. Chin 638* (US); Kaieteur National Park, Kaieteur gorge, W bank Potaro River, 2.5 km from falls, 05°12'N, 59°28'W, 100-170 m, 15 Jul 1993, *T.W. Henkel & R. Williams 2228* (US); Berbice savanna near Takama Army Base, 05°43'N, 57°57'W, 100 m, 14 Aug 1993, *T.W. Henkel et al. 2550* (NY, US); Iwokrama; Essequibo River, Kurupukari Falls, 04°40'31"N, 58°40'57"W, 100 m, 7 Dec 1994, *P. Mutchnick & B. Allicock 566* (US); Pakaraima Mountains, Upper Ireng River, E bank near Catch-Cow mouth, 04°59'N, 60°08'W, 900 m, 14-17 Oct 1994, *T.W. Henkel 5903* (US); Kumukowau River, Camp 3, 160 m, 02°56'N, 59°02'W, 13 Feb 1994, *M.J. Jansen-Jacobs et al. 3736* (U); Maparri River, S bank, 0-6 km from camp at base of waterfall, 03°20'02"N, 59°15'16"W, 3 Jun 1996, *H.D. Clarke & T. McPherson 1889* (US); Rupununi Northern Savanna, Karanambo Ranch, headquarters, near Rupununi River, 03°45'N, 59°10'W, 80 m, 23 Oct 1996, *C.N. Horn & J. Wiersema 11094* (US); Paruima to Ilubia Creek trail, near Kamarang River, 05°47'N, 61°03'W, 500 m, 13 Feb 1996, *H.D. Clarke 1133* (US); Rewa River, gorge below Great Falls, 03°10'40"N, 58°40'25"W, 90 m, 11 Feb 1997, *H.D. Clarke 3489* (US); 5 km N of Paruima, Auratoi Savanna, 05°51'08"N, 61°05'05"W, 760 m, 25 Jul 1997, *H.D. Clarke et al. 6113* (US); 1-3 km S of Paruima, Kamarang River, trail to Illubia Creek, near trail to Utshi Savanna & Venezuela, 05°47'49"N, 61°03'57"W, 500 m, 24 Jul 1997, *H.D. Clarke et al. 6048* (US); Imbaimadai, Mazaruni River, Base Camp, 487 m, 3 Dec 2002, *E.S. Forbes et al. 319* (US); Upper Potaro River, Malek Falls, below new Ayanganna airstrip, 05°16'56.7"N, 59°49'25.7"W, 625 m, 17 Jun 2003, *H.D. Clarke et al. 9976, 9982* (US). SURINAME: Para, Feb-Apr 1844, *A. Kappler 1423* (G); Without locality, 1846, *F.W.R. Hostmann 578a* (G, P-2); Coppename Rivier, 1901!, *H.A. Boon 1256* (U); Prope savanna Kompas, 1901!, *Went 402* (U); Fluv. Gran Rio, 22 Sep 1908, *J. Tresling 477* (U); Fluv. Gran Rio sup., 7 Sep 1910, *J.F. Hulk 236* (U); Fluv. Gran Rio, 18 Oct 1910, *J.F. Hulk 345* (U); Fluv. Gran Rio, 18 Oct 1910, *J.F. Hulk 586* (U); Republiek, 10 Oct 1911, *J. Kuyper 13* (K, U); Apikollo, 29 Jan 1911, *J.F. Hulk 67* (U); Courantyne Rivier, 11 Oct 1916, *G. Stahel & J.W. Gonggrijp 3001* (NY, U); Kleisavanne, Piai Kreek and savanna, 13 Sep 1920, *A.A. Pulle 559* (U); Boven Gran Rio, Maupé Dam, 1932!, *coll. ign. 199* (U); Weyneweg, between Albina and Moengo tapoe, 14 Aug 1933, *J. Lanjouw 443* (U); Coppename Rivier near Raleigh Vallen, 11 Sep 1933, *J. Lanjouw 762* (K, U); Rivier near Gansee, 15 Nov 1933, *J. Lanjouw 1293* (MO, U); Tafelberg, 5-6 Nov 1943, *D.G. Geyskes 989* (U); Lower Saramacca Rivier, vicinity of Tawa Kreek, 12 Jun 1944, *B. Maguire 23746* (F, K, NY, U, US).Coppename Rivier headwaters, Geijskes Kreek, vicinity of Black Water Camp (V), km17, 25 Sep 1944, *B. Maguire 24847* (NY, U, US); Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp, 5 Oct 1948, *J. Lanjouw & J.C. Lindeman 661* (U); Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp, 15 Oct 1948, *J. Lanjouw & J.C. Lindeman 846* (K, NY, U); Klinsavanne bij Vier Kinderen, 5 Sep 1948, *J. Lanjouw & J.C. Lindeman 181* (U); Marowijne bij Bigie-ston, ad ripas fluv., 7 Feb 1949, *J. Lanjouw & J.C. Lindeman 1953* (NY, U); In montibus, qui dicuntur Nassau, Moerasbos bij km 18.7, 22 Mar 1949, *J. Lanjouw & J.C. Lindeman 2928* (NY, U); Savanne langs spoorlijn bij km 106 (along railroad near km 106) [between km 72 and Kabelstation], 22 Apr 1949, *J. Lanjouw & J.C. Lindeman 3025* (K, NY, U); In montibus, qui dicuntur Nassau, 18 Mar 1949, J. *Lanjouw & J.C. Lindeman 2826* (U); Pakka-Pakka (Saramacca) near Ebbatop, 20 Feb 1951, *J. Florschütz & P.A. Florschütz 1608* (U); Ebbatop, v.Asch, v.Wijcks-Geb., 15 Feb 1951, *J. Florschütz & P.A. Florschütz 1468* (U); Ondergroei in bos op hoge plekken op Stoelmanseiland, Marowijne, 17 Aug 1953, *D.G. Geyskes 165* (U); Onvervacht ten zuiden van Paramaribo op stofklei, 21 Oct 1954, *Landbouwproefstation 506* (U); Stalweide bij Onverwacht ten zuiden van Paramaribo, op stofklei, 1955!, *Landbouwproefstation 502* (U); Road from savanna S of Sabakoe to Berlijn (Near Zanderij I), 28 May 1956, *P.C. Heyligers 52* (U); Van Hattumweg, 26 Sep 1958, *Ir J.G.P. Dirven 696* (U); Coesewijne Savanne, 4 Dec 1958, *J. van Donselaar 509* (U); Lobin-savanna inter Zanderij I and Hannover, 24 Sep 1959, *J. van Donselaar & W.A.E. van Donselaar 146* (U); Toekoemoetoe Kreek, fluv. Saramacca sup., 12 Oct 1959, *A.G.H. Daniels & F.P. Jonker 1317* (U); Toekoemoetoe Kreek, fluv. Saramacca sup., 13 Oct 1959, *A.G.H. Daniels & F.P. Jonker 1182* (U); Jodensavanne-

Mapane Kreek area (Suriname Rivier), Apr 1960, *J.P. Schulz 8263* (U, US); Zanderij, 26 Dec 1960, *K.U. Kramer & W. H.A. Hekking 2479* (U); Kappel Savanne, prope pedem australem montis Tafelberg (district Saramacca), 300 m, 15 Feb 1961, *R.M. Tyron 5659* (U); Jodensavanne-Mapane Kreek area (Suriname Rivier), Feb 1961, *J.P. Schulz 8614* (U); Jodensavanne-Mapane Kreek area (Suriname Rivier), 5 May 1961, *J.P. Schulz 8928* (U); Vicinity of cataractarum Raleigh fluv. superioris, Coppenname, District Saramacca, 6 Sep 1961, *W.H.A. Hekking 986* (U); Zanderij, near Berlijn, 45 km S of Paramaribo, 20 Nov 1961, *W.H.A. Hekking 1173* (C, MO, P, U); Road from Derg en Dal to Afobaka road, S. side of Blauwe Berg, 20 Dec 1962, *J.G. Wessels Boer 408a* (U); Kayser airstrip, ca. 25 km above confluence with Lucie Rivier, Zuid Rivier, 270 m, 2 Jul 1963, *B. Maguire et al. 53965* (B, K, NY, P, US); 2 km W of Oost Rivier, 225 m, 11 Jul 1963, *B. Maguire et al. 54131* (NY); vicinity of Kayser airstrip, 45 km above confluence with Lucie Rivier, 270 m, 29 Aug 1963, *H.S. Irwin et al. 55282* (NY, US); Wilhelmina Gebergte, Zuid Rivier, 2 km above confluence of Lucie Rivier, 220 m, 15 Sep 1963, *H.S. Irwin et al. 55740* (MO, NY); Wilhelmina Gebergte, Zuid Rivier, south of Kayser Airstrip, 45 km above confluence with Lucie Rivier, 270 m, 22 Sep 1963, *H.S. Irwin et al. 55960* (MO, NY); Lely dorp near Paramaribo, 0-2 m, 19 Sep 1963, *H.S. McKee 10709* (K, P); Struik Savanne aan W oever van Nickerier Rivier, 3 km N of Kamisavallen, 2 Jul 1965, *P.J.M. Maas & J.A. Tawjoeran LBB11036* (U); Wilhelmina Gebergte, Lucie Rivier, near confluence of Oost Rivier, 225 m, 12 Sep 1963, *H.S. Irwin et al. 55639* (MO, NY); Brownsweg, 8 km ESE of villae Brownsweg, 16 Oct 1964, *J. van Donselaar 1697* (U); Sipaliwini Savanne, 24 Aug 1966, *J. van Donselaar 3529* (NY, U); Sipaliwini Savanne, 25 Aug 1966, *J. van Donselaar 3567* (F, U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 14 Sep 1967, *J. van Donselaar 11752* (U); Sipaliwini Savanne area on Brazilian frontier, 340 m, 18 Sep 1968, *F.H.F. Oldenburger et al. 118* (NY, U); Sipaliwini Savanne area on the Brazilian frontier, 340 m, 30 Dec 1968, *F.H.F. Oldenburger et al. 705* (U); Sipaliwini Savanne area on Brazilian frontier, 3 km SE of Meyers farm on hill top, Jan 1970, *F.H.F. Oldenburger et al. 1192* (U); Lely Mountains, SW plateau covered by ferrobauxite, 550-710 m, 18 Sep 1975, *J.C. Lindeman et al. 16* (C, CAY, F, K, MO, NY, U); Lely Mountains, 175 km SSE of Paramaribo, east slope of plateau no. 1, 500-700 m, 10 Oct 1976, *S.A. Mori & A. Bolten 8434* (NY, U); Zanderij, plantation forest near LBB school, 20 Feb 1977, *J.C. Lindeman, E.A. Mennega, et studentes 104* (U); road to Republiek, 3 km W of Paramaribo-airport road, 29 Sep 1979, *W.W. Thomas 2448* (NY); road to Hanover, 2 km E of road from Paramaribo to airport, 29 Sep 1979, *W.W. Thomas 2394* (NY); Brownsberg Nature Preserve, savanna area near km 11.1, 450-500 m, 24-25 Sep 1979, *W.W. Thomas 2350* (MO, NY); Exp. farm Coebiti, 23 Dec 1981, *A.P. Everaarts 594* (U); vicinity of Blanche Marie Waterfall, on Nickerie Rivier, 50 m, 29 Jan 1999, *R. Evans & K. McDonnell 3122* (US).

21. Rhynchospora ciliata (G. Mey.) Kük., Bot. Jahrb. Syst. 56 (Beibl. 125): 16. 1921. *Dichromena ciliata* Vahl, Enum. Pl. 2: 240., Oct.-Dec. 1805, *nom. illeg.*, non *Dichromena* [as '*Dichroma*'] *ciliatum* Pers., Apr.-Jun. 1805, *nom. illeg.*; *Schoenus ciliatus* G. Mey., Prim. Fl. Esseq. 23. 1818. *Dichromena persooniana* Nees in Martius, Fl. Bras. 2(1): 112. 1842. *Rhynchospora vahliana* Griseb., Fl. Brit. W. I. 577. 1864, *nom. illeg. Rhynchospora nervosa* var. *ciliata* (G. Mey.) Kük., Bot. Jahrb. Syst. 75: 295. 1951. *Rhynchospora nervosa* subsp. *ciliata* (G. Mey.) T. Koyama, Madroño 20: 254. 1970, non *Rhynchospora ciliaris* [as '*ciliata*'] (Michx.) Vahl, Enum. Pl. 2: 235. 1805. [Vahl's incorrect publication of *Rhynchospora ciliata*, based on *Schoenus ciliaris* Michx., should be interpreted as an orthographic variant]. LECTOTYPE: Puerto Rico. *West s.n.* (C-Vahl), designated by M. T. Strong and P. Acevedo-Rodríguez, Contr. U. S. Natl. Herb. 52: 337. 2005. Figs. 15, 74C-D.

Dichromena pura Nees in Martius, Fl. Bras. 2(1): 112. 1842. *Rhynchospora pura* (Nees) Griseb., Fl. Brit. W. I. 577. 1864. TYPE: West Indies; St. Vincent, *Lindley s.n.* (holotype: CGE; isotype: NY).

Dichromena obtusifolia Schrad. ex Nees in Martius, Fl. Bras. 2(1): 113. 1842. LECTOTYPE: Eastern Brazil, *Sellow s.n.* (G), designated by W. W. Thomas, Mem. New York Bot. Gard. 37: 96. 1984.

Rhynchospora jelskiana Boeck., Linnaea 38: 401. 1874. LECTOTYPE: French Guiana; Cayenne, *K. de Jelski 987* (GH), designated by W. W.

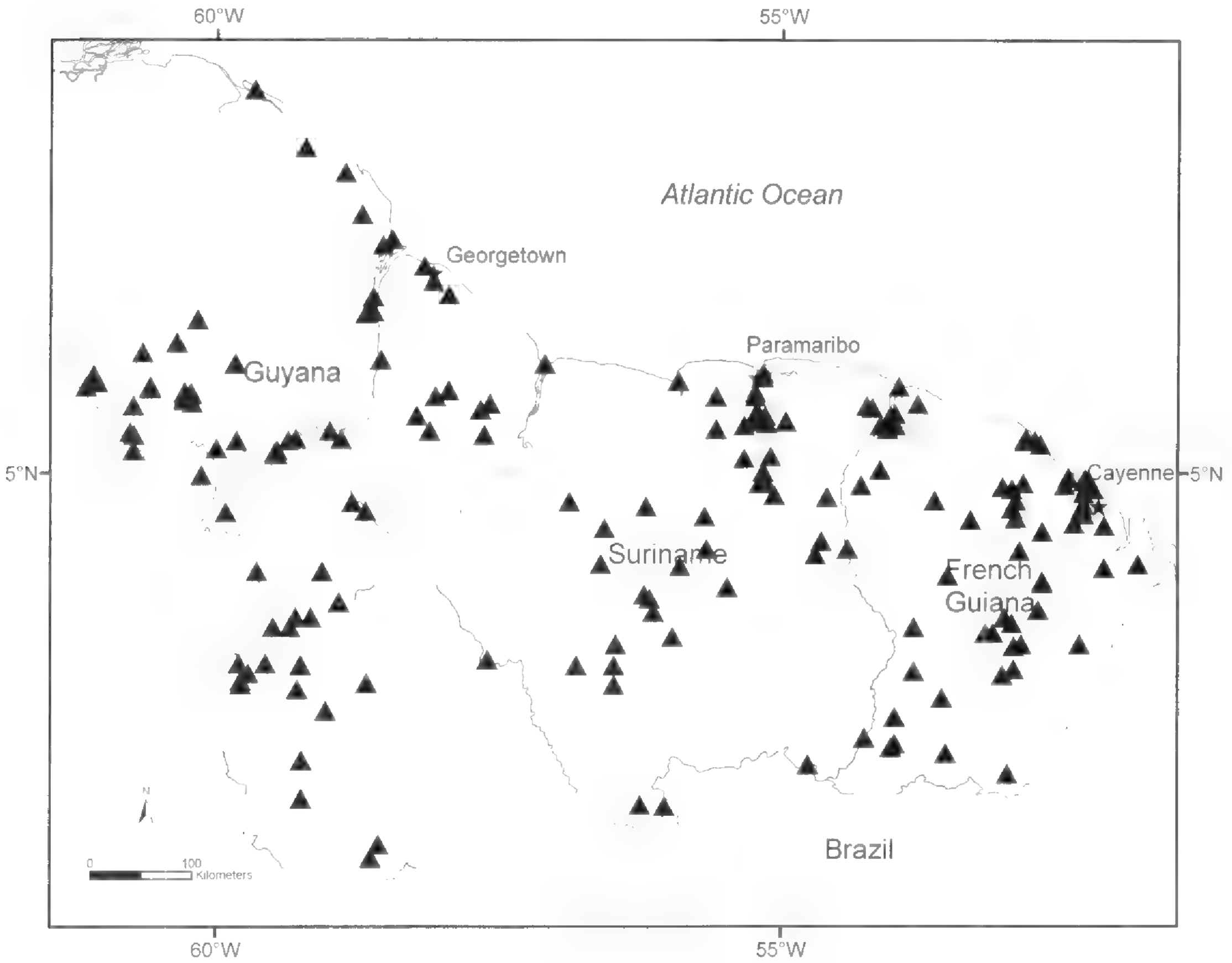

Fig. 14. Distribution of *Rhynchospora cephalotes* in the Guianas.

Thomas, Mem. New York Bot. Gard. 37: 96. 1984. Photos of destroyed holotype which was at B are at F, GH, MO, US-2.

Dichromena ciliata var. *cinnamomea* Kük., Repert. Spec. Nov. Regni Veg. 23: 200. 1926. *Rhynchospora nervosa* var. *cinnamomea* (Kük.) Kük., Bot. Jahrb. Syst. 75: 297. 1951. LECTOTYPE: Venezuela; Nueva Esparta, Isl. de Margarita, El Valle, *Miller & Johnston 189* (NY; isolectotypes: GH, MO, P, US), designated by W. W. Thomas, Mem. New York Bot. Gard. 37: 96. 1984.

Caespitose perennial, 10-50 (-73) cm tall; rhizomes short; roots medium-sized, to 1 mm thick. Culms ascending, (0.7-) 1-1.7 (-2) mm wide, frequently longer than the leaves, obtusely trigonous or shallowly triquetrous, finely ribbed, often indistinctly so, green, glabrous distally, often hirsute proximally; sheathing base of culms and lower nodes 1-4 mm wide. Leaves 5-15 per culm, ascending, basal and lower cauline, 8-65 cm long; sheaths short, loose, finely veined, light green to straw-colored, whitened at base, hirsute to glabrous; ligule absent; blades linear, 1.5-4.5 mm wide, flattened, often folded or margins subinvolute, acuminate at apex, distinctly finely veined abaxially, essentially glabrous, green, finely cellular-reticulate roughened adaxially, glabrous or hirsute proximally, whitish or pale green, margins and abaxial midvein antrorsely scabrous, long-ciliate proximally. Inflorescence a glomerate, hemispherical head of 5-16 spikelets at the summit of the culm, 10-17 (-20) mm in diam.; involucral bracts 7 or 8, longer than the inflorescence, white on adaxial surface basally, green and glabrous to hirsute abaxially at base, the margins ciliate proximally, narrowly acuminate at apex; spikelets ovate to widely-ovate, 5-10 × 2-4 mm, acute to narrowly acute at apex, rounded at base, with 10-

35 scales; scales all fertile except for basal scale of spikelet, ovate, 3.5-5 × 2-3 mm, broadly cymbiform, curvate, slightly keeled distally, dorsally obtuse to rounded, glabrous, whitish, frequently red-lineolate, midcosta narrow, pale, green distally, extending beyond the acute, obtuse, rounded or emarginate apex as a short, straight or recurved mucro. Stamens 3, the anthers (1.7-) 2-3 mm long, bluntly apiculate, truncate at base with minute crystalline lobes or papillae; styles 2-branched to ca. 1/3 length of style. Achene biconvex, turgid, obovate to depressed-obovate, 1.3-1.8 × 1.1-1.6 mm, rounded to broadly rounded at apex forming a very fine rim around base of style, short-cuneate at base, transversely rugulose, shiny, stramineous to dark yellowish brown at maturity; epidermal cells rectangular, vertically oriented; style base triangular with concave margins that are shortly decurrent on shoulders of achene, 0.5-0.8 long, about as wide as the achene, rounded or obtuse at tip, whitish to light brown or brown at maturity; bristles absent.

Distribution: Mexico, Central America, West Indies, Trinidad, Tobago, and South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, Bolivia, Paraguay, and Argentina).

Habitat in the Guianas: Savanna, wet grassy areas, swampy areas, disturbed forest, agricultural areas, and roadsides, 0-500 m.

Discussion: Koyama (1970; 1972) and Thomas (1984; 1992; 1998) treated this as a subspecies of *Rhynchospora nervosa* (Vahl) Boeck. However, cytogenetic studies by Luceño et al. (1998) indicate that it should be treated as a separate species. It consistently had a diploid chromosome number of $2n = 10$ in thirty specimens from four populations sampled, while *R. nervosa* had a polyploid chromosome number of $2n = 30$ and 20 in two populations. There are also several other characteristics that separate *R. ciliata* and *R. nervosa*. The sympodial rhizomes of *R. ciliata* have short internodes giving rise to a tufted habit, while those of *R. nervosa* have long internodes giving rise to a non tufted habit where culms are more dispersed, growing singly at tips of elongated rhizomes (not crowded together in a clump). They also have different ecological preferences. *Rhynchospora ciliata* often occurs in ruderal and disturbed areas, while *R. nervosa* is restricted to sand savannas.

Specimens examined: French Guiana: Cayenne, 1835, *M. Leprieur s.n.* (G); Cayenne, 1859, *P. Sagot 1354* (K, P-3); Vicinity of Cayenne, 30 Apr 1921, *W.E. Broadway 66* (NY); Cayenne, route de Montabo, 04 Jul 1955, *J.J. Hoock s.n.* (P); Savane Changement, 6 km de Sinamary, 16 Apr 1976, *C. Sastre 4806* (CAY, P); Cyperaceae rudérale dans une concession de la ville de Cayenne, 27 Mar 1979, *M.F. Prévost 490* (CAY, P); Cayenne, Centre ORSTOM, 2 Aug 1982, *A. Fournet 227* (CAY-2, P); Cours ORSTOM à Cayenne, 13 Dec 1982, *Merlier GY251* (CAY); Ile de Cayenne, Anse de Montabo, propriété de Granville, 17 Feb 1984, *J.J. de Granville 6635* (CAY, P); Ile de Cayenne, Anse de Montabo, 17 Feb 1984, *C. Feuillet 6635* (NY); Cayenne, ORSTOM, 5 Mar 1985, *D.Y. Alexandre 288* (CAY-2); Bourg de Cayenne, Ile de Cayenne, Chemin Grant, 2 m, 04°50'N, 52°20'W, 19 Jan 1988, *M. Philippe 5* (CAY); Cayenne, 16 Nov 1989, *C. Feuillet 4515* (CAY); Route du Rolita, 27 Jan 1990, *D.E.A. IV Paris 9* (CAY); Mont Rorota, Ile de Cayenne, 04°53'N, 52°15'W, 22 Jun 1992, V. Wittingthon 11 (CAY); Ile de Cayenne, 04.5°50'N, 52.5°20'W, 16 May 1994, *S. Albertini 85* (CAY). Guyana: Waramaden, around village and between airstrip and creek, 05°48'N, 60°44'W, 490 m, 12 Jun 1990, *T. McDowell & D. Gopaul 3204* (NY, U, US); Baramita, clearings near airstrip, 07°23'N, 60°29'W, 91 m, 7 Apr 1991, *T. McDowell et al. 4295* (NY, US); Dadanawa Ranch, near compound, Nantun Bush Island, 0.5 km W of Rupununi River, 02°48'40"N, 59°32'06"W, 130 m, 7 Jul 1996, *H.D. Clarke et al. 2139* (US). Suriname: Republiek, Sep 1914, *E. Essed 86* (K, P, U); Zanderij Savanne, Feb 1976, *R. Jansma LBB15654* (U).

22. Rhynchospora comata (Link) Roem. & Schult., Mant. 2: 50. 1824. *Schoenus comatus* Link, Enum. Hort. Berol. Alt. 1: 41. 1821. Type: Brazil, *Sellow s.n.* (holotype: B, destroyed). Figs. 15, 60C-D.

Rhynchospora bromoides Kunth, Enum. Pl. 2: 300. 1837. Type: Southern Brazil, *Sellow s.n.* (holotype: B, destroyed).

[*Rhynchospora sylvatica* Nees, Linnaea 9: 297. 1834, *nom. nud.*].

Rhynchospora didrichsenii Boeck., Beitr. Cyper., Heft 2: 25. 1890. Type: Brazil; Bahia, *Didrichsen 3999* (holotype: B, destroyed; isotype: C, photo US ex C).

Rhizomatous perennial, 28-93 (-136) cm tall; rhizomes short, knotty; fibrous remnants of old leaf

sheaths often present, the culms arising singly or 2 or 3 together from the rhizome; roots medium to coarse, 0.5-1.5 mm thick; sheathing base of culm 5-17 mm wide just above rootstock. Culms ascending, (1-) 1.3-4.2 mm wide, acutely trigonous to triquetrous, hardened, finely ribbed, green, short pubescent and often interspersed with longer trichomes to glabrate. Leaves linear, ascending, primarily basal, 2-4 cauline, 8-25 per culm, 20-80 (-95) cm long; sheaths eligulate, herbaceous, smooth and silvery-whitened adaxially on basal sheaths, finely veined abaxially, short pubescent to glabrate abaxially, the inner band membranous on lower sheaths, herbaceous (except for orifice) on upper sheaths, green, brown to reddish brown tinged proximally, with U-shaped orifice; blades linear, (2.8-) 4-11.4 mm wide, flattened to subplicate or sometimes folded, herbaceous, finely veined, green to subglaucous adaxially, scabrous-roughened and short pubescent to glabrate adaxially and abaxially, often with coarser longer stiffish hairs abaxially as well, these often dense proximally, margins antrorsely scabrous and long-ciliate proximally, these trichomes becoming sparse to absent distally. Inflorescence a terminal and series of 1-3 remote to rarely subcontiguous, somewhat lax pyramidal partial panicles from the upper leaf-like bracts; bracts elongate, to 35 cm long, generally shorter and narrower than blades; partial panicles 1.6-7 × 1.8-6 cm; panicle branches trigonous or quadrangular in cross section, the margins ciliate, short-pubescent to glabrate; spikelets 5-75 per partial panicle, ovoid to ovoid-ellipsoid, narrowly acute at apex, short-cuneate at base, 6.5-8.5 (-9) × 1.5-3.3 (-3.5) mm, spreading with maturing achenes, uniformly light brown to brown, finely reddish lineolate; scales 12-21 per spikelet, thin, herbaceous, uniformly light brown to brown, finely reddish lineolate, smooth, glabrous, margins escarious or at most with a very narrow scarious margin, apex acute to acuminate on upper fertile scales, midcosta fine, pale brown, inconspicuous, prolonged as a short 1-3 mm long awn, or on upper scales of spikelet, a short mucro; fertile scales 7-11, broadly ovate to ovate-elliptic or ovate-lanceolate, 5-6.5 × 2-4 mm; sterile scales 5-10, ovate to ovate-elliptic, 1-5 (-6) × 1-3.5 mm. Stamens 3, the anthers 2-2.5 mm long, apiculate at apex, shortly bi-lobed at base; style 2-branched, about as long as bristles, not exceeding spikelet scales, the branches about the same length as unbranched portion. Achene biconvex, often falcately bent, obovate to rounded-obovate, 2-3 (-3.2) × 1.9-2.5 mm, acute to acuminate to base, rounded to broadly rounded or subtruncate at apex, smoothish, indistinctly finely cellular-reticulate, brown to dark brown with pale brown center on each side; epidermal cells isodiametric, no central nodules evident; style base triangular-lanceolate, acuminate to tip, 1.7-3 mm long, 1.5-2 mm wide at base, somewhate cellular-spongy, greyish brown; bristles 6, very fine and thread-like, overtopping achene body, shorter than to equaling or slightly exceeding style base, finely and minutely antrorsely barbed, reddish with black barbs.

Distribution: Central America (Costa Rica and Panama), Trinidad, and northern South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: Generally in upland habitats, often on granitic substrates; rocky hillsides, plateaus, granite inselbergs in "savane roche" (rock savanna) communities, balds, mountain summits, creek beds, savanna, and mixed forest, 100-950 m.

Specimens examined: FRENCH GUIANA: Cayenne, Montagne des Maringouins, 15 Nov 1957, *J.J. Hoock s.n.* (P); Fleuve Approuague, Rivière Arataye, Saut Pararé, 100 m, 23 Oct 1978, *C. Sastre 6233* (CAY, P); Montagnes de la Trinité, inselberg granite à l'extrèmité nord ouest des Monts de la Trinité, 4 Aug 1981, *J.J. de Granville 4749* (CAY, NY, P, U); Pied du Piton Rocheux Remarquable, haut de la Crique Armontabo, Ouest Bas Oyapock, 24 Feb 1981, *G. Cremers 7108* (CAY); sud de Cayenne, Mont Matoury, 4 May 1983, *G. Cremers 8068* (CAY, NY, P); Massif des Emerillons, vallée de l'Approuague, 19 Dec 1983, *C. Feuillet 1303* (CAY); ENE du Grand Croissant, Haute Crique Nouciri affluent de l'Oyapock, N. Camopi, 200-260 m, 3 Dec 1983, *G. Cremers 8263* (CAY, P); Haute Camopi; Monts Belvédère, 200 m, 28 Nov 1984, *J.J. de Granville 7052* (NY, P); Montagnes de la Trinité, sommet nord, 400 m, 12 Jan 1984, *J.J. de Granville et al. 5897* (CAY, NY, P, U); Montagnes de la Trinité, Inselberg N-Ouest, 250 m, 16 Jan 1984, *J.J. de Granville et al. 6010* (CAY, NY, U); Haute Camopi: Monts Belvédère, 300 m, 25 Nov. 1985, *J.J. de Granville 7017* (B, NY, P); Akouba Booka goo Soula, Camp #3, bassin du Haut Marouini, 160 m, 27 Aug 1987, *J.J. de Granville et al. 9776* (CAY, P, US); Station des Nouragues, Bassin de l'Approuague, Arataye

Chemin Coco, 150 m, 04°03'N, 52°42'W, 17 Nov 1989, *G. Cremers 10808* (CAY, NY); Inselberg Talouakem, Massif des Tumuc-Humac, 02°29'N, 54°45'W, 550 m, 16 Aug 1993, *J.J. de Granville et al. 12321* (CAY, US); Mont Bakra, Region des Emerillons, 550 m, 03°18'N, 52°57'W, 15 Apr 1993, *G. Cremers 13096* (NY); Inselberg Talouakem, Massif des Tumuc-Humac, 02°29'N, 54°45'W, 600 m, 9 Aug 1993, *J.J. de Granville et al. 12156* (CAY, US); D.Z. 5, Route Régina-Saint-Georges, Bassin de L'Approuague, 100 m, 04°02'N, 52°01'W, 26 Nov 1995, *J.J. de Granville & G. Cremers 13160* (CAY, K, NY, U); Roche Touatou, Bassin de l'Oyapock, 170 m, 02°57'N, 52°32'W, 17 May 1995, *G. Cremers & J.J. de Granville 13961* (CAY); Monts d'Arawa, Pied du versant sud-est de la grande savane-roche, rive droite de la Crique, 02°49'N, 53°22'W, 200 m, 11 Jul 2002, *J.J. de Granville et al. 15206* (CAY, K, NY, P, U, US). GUYANA: Without locality, 1839, *R. Schomburgk 676* (BM, F, G, K, NY, P); Mazaruni "Massaroonie", 1867, *C.F. Appun 215* (K); Macouria River, Nov 1886, *G.S. Jenman 2479* (BM, K); Bartica, Essequibo River, Nov 1888, *G.S. Jenman 6092* (K); Penal Settlement, on W side of Essequibo River, near mouth of Mazaruni River, 3 Dec 1919, *A.S. Hitchcock 17070* (NY, US); Bartica, 7 Oct 1922, *H. Leng s.n.* (NY); Rupununi,1934, *Herbarium 71* (K); Kanuku Mountains, drainage of Takutu River, Western extremity of Kanuku Mountains, 500 m, 4-22 Mar 1938, *A.C. Smith 3174* (G, K, MO, NY, P-2, U, US); forest trail to Mt. Iraimakipang, 18 Aug 1963, *R.J.A. Goodland & P.F. Maycock 472* (NY); Marudi Mountains, on top of Mazoa hill near drilling area, 450 m, 10 Nov 1982, *A.L. Stoffers et al. 262* (CAY, K, NY, U, US); Along trail from Karasabai Village to Tipuru Village, 300-500 m, 04°10'N, 59°30'W, 4 Jan 1982, *S. Knapp & J. Mallet 2827* (MO); Kanuku Mountains, Rupununi River, 150 m, 16 Feb 1985, *M.J. Jansen-Jacobs et al. 255* (CAY, K, NY, P, U, US); Trail from abandoned balata bleeders' camp to the top of Mt Makarapan, 300 m, 03°59'N, 58°57'W, 18 Sep 1988, *P.J.M. Maas et al. 7531* (CAY, K, NY, P, U); SE Kanuku Mountains, 03°04'N, 59°25'W, 250-350 m, 25 Jun 1989, *L.J. Gillespie et al. 1819* (CAY, NY, US); Rupununi savanna, Natun Bush Island, ± 2 km SSW of Dadanawa, 02°49'N, 59°28'W, 120-150 m, 18 Jun 1989, *L.J. Gillespie et al. 1687* (MO, NY, U, US); NE of Warimure, eastern Kanuku Mountains, Rupununi District, 200-500 m, 23 Jan 1991, *M.J. Jansen-Jacobs et al. 2192* (CAY, NY, U, US); Warimure, NE of, eastern Kanuku Mountains, Rupununi District, 200-500 m, 25 Jan 1991, *M.J. Jansen-Jacobs et al. 2233* (CAY, K, MO, NY, U, US); Kumukowau River, Camp 3, 160 m, 02°56'N, 59°02'W, 13 Feb 1994, *M.J. Jansen-Jacobs et al. 3739* (U); NW Kanuku Mountains, top of Nappi Mountain, 12 km S Nappi village, 03°18'N, 59°33'W, 750-950 m, 8 Feb 1993, *B. Hoffman & R. Foster 3573* (NY, US); NW Kanuku Mountains, 12 km ESE Nappi village in foothills, 03°23'N, 59°29'W, 170 m, 12 Feb 1993, *B. Hoffman 3727* (NY, US); Kanuku Mountains, Crabwood Creek, Camp 2, 260 m, 03°07N, 59°06'W, 22 Jan 1994, *M.J. Jansen-Jacobs et al. 3924* (U); Kanuku Mountains, Crabwood Creek, Camp 2, 260 m, 03°07'N, 59°06'W, 22 Jan 1994, *M.J. Jansen-Jacobs et al. 3294* (U); South Rupununi, Toot River, 40 km SE Aishalton village along Marudi Road, 02°15'N, 59°10'W, 250 m, 26 Apr 1994, *T.W. Henkel & R. James 3753* (US); Kanuku Mountains, Crabwood Creek, Camp 2, 260 m, 4 Feb 1994, *M.J. Jansen-Jacobs et al. 3552* (U, US); Dadanawa, Rupununi River, 120 m, 9 Jun 1995, *M.J. Jansen-Jacobs et al. 4014* (U, US); Makawatta massif, westernmost part, 03°05'24"N, 59°26'43"W, 750 m, 31 May 1996, *H.D. Clarke & T. McPherson 1856* (US); Rewa River, summit of unnamed peak, 5.6 km W of camp, 02°58'49'N, 58°38'27"W, 400 m, 19 Feb 1997, *H.D. Clarke 3693* (US); Rewa River, gorge below Great Falls, 03°10'40"N, 58°40'25"W, 90 m, 11 Feb 1997, *H.D. Clarke 3471* (US). SURINAME: Fluv. Gran Rio rep., 18 Oct 1910, *J.F. Hulk 330, 331* (U); In montibus, qui dicuntur Emmaketen, 01 Sep 1959, *A.G.H. Daniels & F.P. Jonker 905* (U); Coppename Rivier, Kroetoe Berg, 27 Nov 1943, *D.G. Geyskes 1033* (U); Saramacca Rivier, vicinity Camp No. 2, 18 Jul 1944, *B. Maguire 24138* (NY, U, US); bij km 25 in lijn van Pakka-Pakka (Saramacca) naar Ebbatop (v.Asch v.Wijcks-Geb.), in de schaduw, 14 Feb 1951, *J. Florschütz & P.A. Florschütz 1406* (U); Tn lijn van Pakka-Pakka (Saramacca) naar Ebbatop (v.Asch v.Wijcks-Geb.), tussen km 15 en 22, 18 Feb 1951, *J. Florschütz & P.A. Florschütz 1548* (U); 9 km N of Lucie Rivier, 12 km W of Oost Rivier, 275 m, 03°36'N, 56°30'W, 18 Jul 1963, *B. Maguire et al. 54255* (NY); 7 km SSW of Juliana Top, 12 km N of Lucie Rivier, Wilhelmina Gebergte, 450 m, 03°36'N, 56°30'W, 1 Sep 1963, *H.S. Irwin et al. 55314* (F, K, MO, NY, U, US); Wilhelmina Gebergte, rivierdal bij camp km 14,

langs lijn near Lucie Rivier, 25 Jul 1963, *J.P. Schulz 10459* (U); Wilhelmina Gebergte, rivierdal bij camp, km 14, langs lijn near Lucie Rivier, 18 Jul 1963, *J.P. Schulz 10115* (U); Wilhelmina Gebergte, 9 km N of Lucie Rivier & 12 km W of Oost Rivier, 520 m, 16 Jul 1963, *B. Maguire et al. 54206* (NY, U); In montibus Bakhuis inter flum. Kabalebo & Coppename Sinistrum, 250 m, 31 Dec 1964, *P.A. Florschütz & P.J.M. Maas 2600* (U); Raleighvallen-Voltzberg Nature Reserve on the Coppename Rivier, 18 Nov 1976, *S.A. Mori & A. Bolten 8655* (NY, U); Ulemari Riv. Pelenepun Piek (inselberg), 02°43'16"N, 54°51'43"W, 26 Apr 1998, *Raghoenandan et al. UVS 17889* (U).

23. Rhynchospora contracta (Nees) J. Raynal, Adansonia Ser. 2. 17: 277. 1978. *Haloschoenus contractus* Nees in Martius, Fl. Bras. 2(1): 123. 1842. *Dichromena contracta* (Nees) Steud., Syn. Pl. Glumac. 2: 136. 1855. *Rhynchospora micrantha* var. *contracta* (Nees) Boeck., Linnaea 37: 609. 1873. TYPE: Brazil; Piauí, *Martius s.n.* (holotype: M). Figs. 21, 84A-B.

Juncus parviflorus Poir. in Lamarck, Encycl. Suppl. 3: 160. 1813, non Ehrhart, 1791. TYPE: Puerto Rico, *Ledru 11 b* (holotype: P; isotype: P).

Zosterosperumum gracile Ham., Prodr. Pl. Ind. Occid. 14. 1825, non *Rhynchospora gracilis* Vahl, 1805. TYPE: West Indies; "India occidentali" (holotype: P-Desv.).

[*Scleria minutiflora* Rich. ex Spreng. in L., Syst. Veg. ed. 16, 3: 831. 1826, *nom. nud.* *Rhynchospora minutiflora* C. D. Adams, Phytologia 21: 70. 1971, *nom. invalid.*]. *Scleria minutiflora* is a nomen nudum proposed by Sprengel and placed by him as a

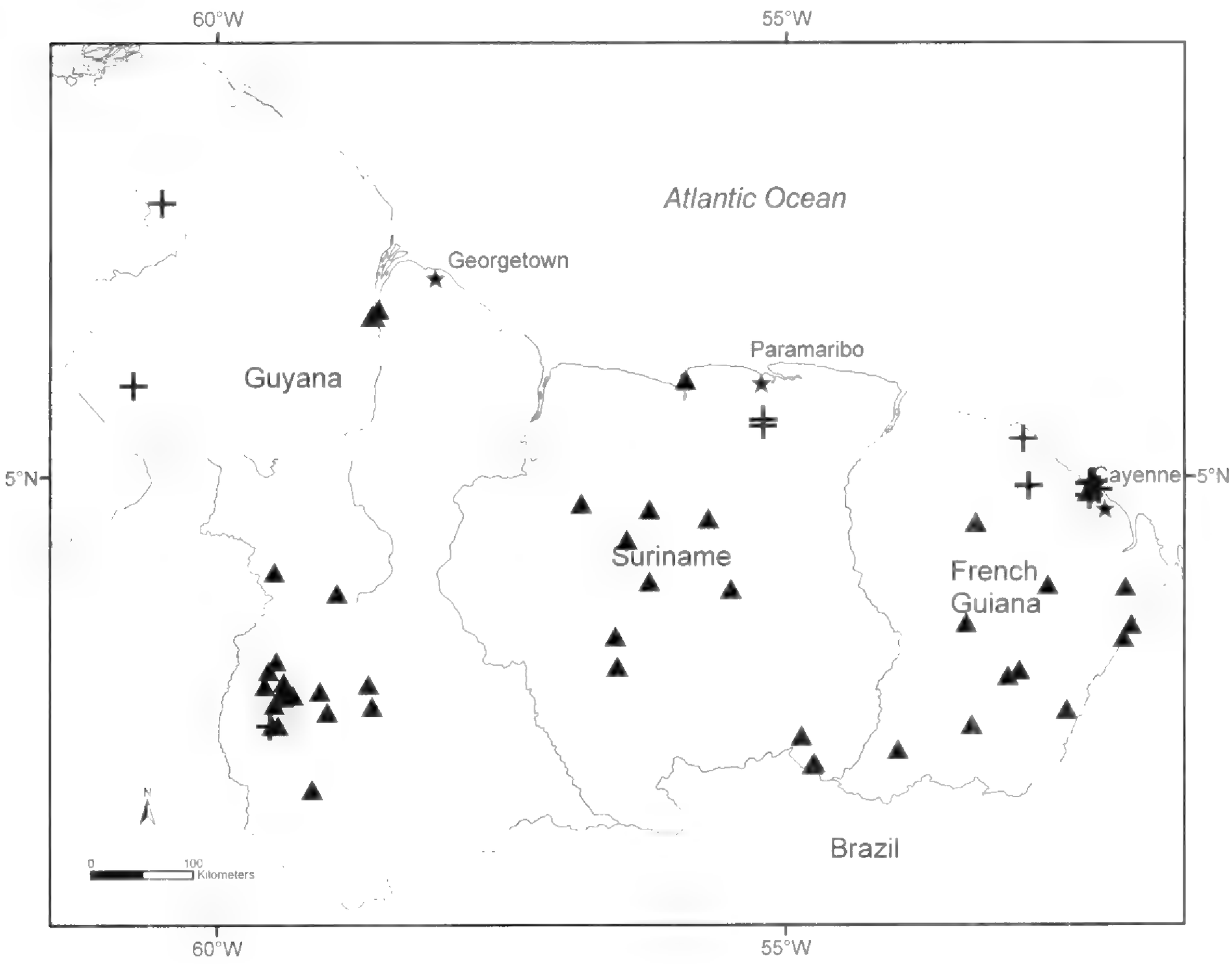

Fig. 15. Distribution of ✚*Rhynchospora ciliata* and ▲*R. comata* in the Guianas.

synonym of *Scleria reticularis* Michx. The name is perhaps based on a specimen in the British Museum of Natural History (BM) in London from Cayenne, French Guiana that is conspecific with *Rhynchospora contracta*.

Rhynchospora sparsa Sieber ex C. Presl in Oken, Isis 21: 268. 1828, non Vahl, 1805. *Haloschoenus sparsus* Nees in Martius, Fl. Bras. 2(1): 123. 1842. TYPE: Mexico, *Haenke s.n.* (holotype: PR).

[*Haloschoenus pygmaeus* Nees, Linnaea 9: 296. 1834, *nom. in syn.*].

[*Rhynchospora polyphylla* Balb. ex Kunth, Enum. Pl. 2: 279. 1837, *nom. in syn.*].

[*Rhynchospora parviflora* Vahl ex Nees in Martius, Fl. Bras. 2(1): 123. 1842, *nom. in syn.*].

Scleria cincta Steud., Syn. Pl. Glumac. 2: 177. 1855. TYPE: Guadeloupe, *E.P Duchassaing de Fontbressin s.n.* (holotype: P; isotype: P-2).

[*Rhynchospora micrantha* Willd. in sched. (B-W 1132, from Puerto Rico)].

Rhynchospora micrantha sensu C. B. Clarke in Urb., Symb. Antill. 2: 117. 1900, non Vahl, 1805 (which is an illegitimate name because Vahl cited *Schoenus rariflorus* Michx., a different species, as a synonym ot it).

Caespitose annual, 4.5-45 cm tall; roots fine to medium. Culms ascending, 0.4-0.8 mm wide, triquetrous to compressed-trigonous, soft, finely ribbed, smooth, green, glabrous. Leaves numerous, basal and cauline, the upper cauline bracts subtending corymbs, (2-) 3-25 cm long; sheaths short, eligulate, inflated, finely veined, green to pale green, glabrous, inner band herbaceous, membranous only at orifice on cauline sheaths, the orifice truncate to concave, often brownish along margin; blades ascending, narrowly linear, flattened, (0.4-) 0.5-2.2 mm wide, green, glabrous, finely veined, veins scarcely evident adaxially, distinct abaxially and pale green, margins antrorsely scabrous distally, smooth proximally, midvein antrorsely scabrous distally on abaxial side. Inflorescence a teminal and series of 1-4 compound corymbose partial panicles with ascending to divergent or reflexed branches from the upper leaf-like bracts; bracts generally within same size range as leaf blades; terminal corymb widely ovoid to depressed-ovoid, 8-60 × 11-75 mm, lateral corymbs in same size range as terminal except for the lowermost one which is often reduced; central rachis subtriquetrous in cross section, lateral primary corymb branches compressed or subterete in cross section, ribbed, smooth, glabrous, divergent to reflexed at maturity, greatly elongating, up to 4 cm long at maturity, the spikelets often in small clusters at branch tips; spikelets small, ovate-elliptic with acute apex, obtusely narrowed at base, 1.5-2 × 0.5-0.7 mm, the scales widely spreading with developing achenes; scales 5-8 per spikelet, ovate to widely ovate, dorsally obtuse to rounded on mature scales, acute on immature scales, submembranous, subtranslucent, brown with minute reddish lineations, acute to subacuminate at apex, midcosta fine, antrorsely scabrous distally, pale brown, extending as a short mucro below scale apex, not prolonged beyond apex; fertile scales 4 or 5, 1-1.3 × 0.6-1.2 mm; sterile scales 1-3, 0.8-1.1 × 0.5-0.6 mm, often short-awned. Stamens 2, the anthers small, oblong-elliptic, 0.3-0.5 mm long, bluntly apiculate at apex, truncate and minutely papillate at base; style 2-branched, the branches about as long as unbranched portion, shortly exserted from scale. Achene broadly biconvex to nearly rounded in cross section, 0.8-1 × 0.9-1 mm, depressed-obovate, broadly rounded at apex, subrounded at base with short-stipitate cellular reticulate base, surface rugose, stramineous or light brown to blackish brown at maturity, margins costate; epidermal cells linear, vertically oriented; style base compressed proximally, 0.3-0.4 mm long, as wide as achene body, forming 2 strap-like lobes that are decurrent on shoulders of achene body, abruptly narrowing distally into a short triangular-lanceolate tip; bristles absent.

Distribution: Mexico, Central America (Guatemala, Honduras, Nicaragua, El Salvador, Costa Rica, and Panama), Greater Antilles (Cuba, Hispaniola, Jamaica, and Puerto Rico), Trinidad, and South America (French Guiana, Venezuela, and Argentina).

Habitat in the Guianas: Known only from French Guiana by a single collection.

Specimens examined: FRENCH GUIANA: Cayenne, without date, *Dr. Moen s.n.* (B).

24. Rhynchospora cordatachenia M. T. Strong, Novon 15: 480. 2005. TYPE: French Guiana; Environs de Cayenne, Savane du Gallion, 9 Sep 1979, *A. Raynal-Roques 21566A* (holotype: US-3464701) [originally mixed with *Rhynchospora tenerrima* Nees ex Spreng. and distributed as *A. Raynal-Roques 21566*].

Figs. 16, 21, 88E-F.

Caespitose perennial, 7-13 cm tall; rhizome short; roots fine, light brown. Culms spreading-ascending, 0.3-0.6 mm wide, filiform, obtusely-trigonous to terete or nearly so, soft, flexuous, finely ribbed, pale green to stramineous, glabrous. Leaves 1-3 per culm, ascending, basal and lower cauline, 0.1-10 cm long; sheaths short, closely clasping culm, ligulate with a narrow band of tissue present at adaxial junction of sheath and blade, herbaceous, finely ribbed, light brown to stramineous distally, glabrous, the inner band membranous, truncate at apex, brown, tinged with red; blades filiform, 0.2-0.4 mm wide, involute to cresenctform-capillary, herbaceous, cellular-reticulate adaxially, finely veined abaxially, green, glabrous, margins smooth proximally, antrorsely scabrous towards apex, attenuate to subflattened tip. Inflorescence a terminal and 1 or 2 corymbose partial panicles from the upper bracts, the terminal panicle 4-9 × 2-5 mm, with 3-6 spikelets; bracts leaf-like, 1-7 cm long, the axillary one elongate and often exceeding subtending panicle; branches short, very slender and filiform, flattened-trigonous or subterete in cross section; spikelets slenderly ellipsoid-lanceoloid, 3-4 × 0.6-1 mm, straight, acuminate to apex, narrowly cuneate at base; rachilla strongly flexuose at maturity; scales dorsally obtuse to rounded, herbaceous, distal scales of spikelet thinly herbaceous to submembranous, brown, proximal and medial scales thickly herbaceous, smooth and glossy, uniformly pale brown, glabrous, margins scarious, midcosta very fine, indistinct proximally, prolonged beyond the obtuse to acute apex as a short antrorsely scabrous awn which is slightly recurved; fertile scales 5 or 6, ovate-elliptic to ovate-lanceolate or lanceolate, 2-2.7 × 0.9-1.2 mm; sterile scales 2 at base of spikelet, ovate-elliptic, 1.2-1.5 × 0.5-0.8 mm. Flowers bisexual; stamens 1, the anthers 0.6-0.8 mm long, apiculate at apex, minutely papillose at base; style 2-branched, equaling to $^2/_3$ length of unbranched portion, long-exserted from subtending scale. Achene unequally biconvex, ovate-rounded or somewhat ovate-quadrate, 0.8-0.9 × 0.7-0.8 mm, obtuse to subtruncate at apex, cordate to slightly so at base, narrowly stipitate, transversely rugulose with 6 or 7 rugae per face, narrowly cellular-reticulate along margins and at base, shiny with a crystalline appearance, whitish tinged with brown; epidermal cells linear, vertically oriented; style base narrowly triangular-lanceolate with a flaring, 2-lobed base (like a witch's hat), flattened, 0.4 × 0.3-0.4 mm, attenuate to apex, brown to dark brown; bristles absent.

Distribution: Endemic to French Guiana. Known only from the type collection.

Habitat in the Guianas: In coastal plain savanna.

Distinguishing features: Among the species of *Rhynchospora* section *Tenues*, *R. cordatachenia* is unique in having an achene with a cordate base and a style base that is narrowly triangular-lanceolate with a flaring, 2-lobed base (shaped like a witch's hat).

25. Rhynchospora corymbosa (L.) Britton, Trans. New York Acad. Sci. 11: 84. 1892. *Scirpus corymbosus* L., Cent. Pl. 2: 7. 1756. LECTOYPE: Asia. "Habitat in India" (LINN 71.48), designated by K. Gordon-Gray, Strelitzia 2: 150. 1995. Figs. 17, 59C-D.

Schoenus floridus Rudge, Pl. Guian. 15, t. 18. 1805. TYPE: French Guiana, *Martin s.n.* (holotype: BM!).

Rhynchospora aurea Vahl, Enum. Pl. 2: 229. 1805. TYPE: India; "habitat in India orientali", *Koenig s.n.* (holotype: C-Vahl).

Schoenus surinamensis Rottb., Descr. Pl. Rar. 14. 1772; Descr. Icon. Rar. Pl. 68, t. 21, fig. 1. 1773. *Rhynchospora surinamensis* (Rottb.) Nees, Linnaea 9: 297. 1834. TYPE: Suriname (no type designated).

Robust, coarse, rhizomatous perennial, 60-200 cm tall; rhizome short, stout, hardened; roots coarse, 1-3.7 mm thick, greatly elongating in water, sometimes developing at lower nodes of culm; sheathing base of culm stout, 1-3 cm wide. Culm ascending, 2-8 (-11) mm wide, trigonous with plane sides to triquetrous, hardened and stiff, finely ribbed, finely antrorsely scabrous, with subappressed barbs on marginal ribs, pale green to green, glabrous, often channeled along one margin distally, the edges of the channel antrorsely scabrous. Leaves 5-15 per culm (not including upper inflorescence bracts), 40-190 cm long, ascending, basal and cauline, the upper cauline bracts subtending inflorescence corymbs; sheaths eligulate, elongate, inflated distally, often spongy-thickened on basal leaves, herbaceous, substiffened, finely veined, antrorsely scabrous

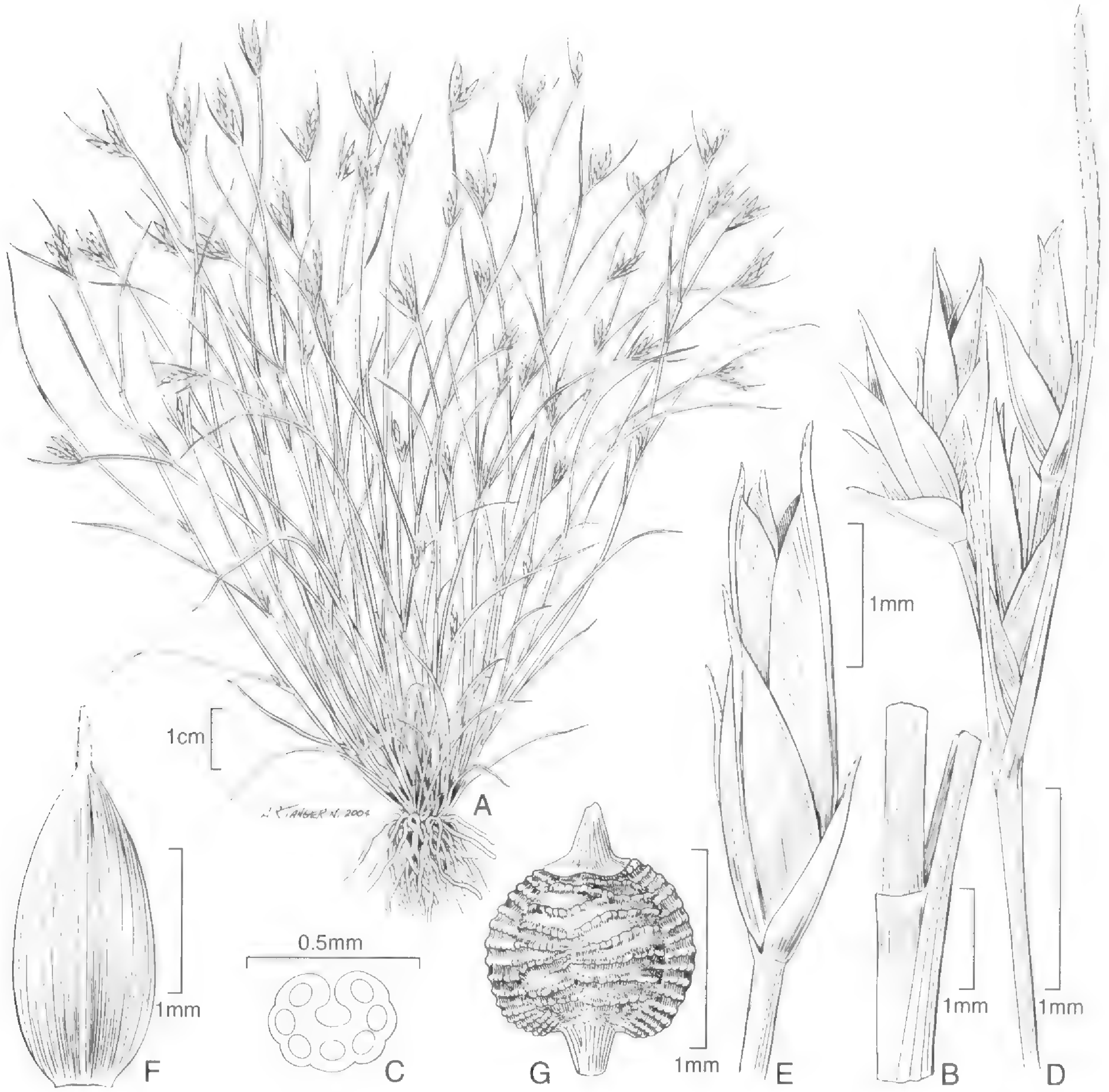

Fig. 16. *Rhynchospora cordatachenia*. A. Habit. B. Section of culm showing junction of leaf sheath and blade. C. Cross section of leaf blade. D. Terminal inflorescence panicle. E. Spikelet. F. Spikelet scale. G. Achene. (A-G, from the holotype, *Raynal-Roques 21566A*, US).

along margins on cauline sheaths, smooth on basal sheaths, pale green or sometimes tinged with brown, glabrous, the inner band membranous on basal sheaths, only the orifice membranous on cauline sheaths, often cross-puckered, with convex orifice on basal and lower cauline sheaths, U-shaped orifice on upper inflorescence bracts; blades linear, 8-23 mm wide, 1-costate, herbaceous to substiffened, finely many-veined, essentially smooth, green, glabrous, margins and midvein beneath antrorsely scabrous, the apex long-acuminate, triquetrous. Inflorescence a terminal and series of 1-4 corymbose, lax, remote to subcontiguous partial panicles from the upper leaf-like bracts; bracts generally shorter and narrower than leaf blades, overtopping subtending corymbs; terminal corymb 6-21 × 7.5-17.5 cm, generally the largest, depressed obovoid, generally wider than

long, the lateral gradually reduced below; inflorescence branches ascending to divergent, trigonous to compressed-trigonous or crescentiform; spikelets many, in hemispherical fascicles at branch tips, ovoid-ellipsoid or ellipsoid, acute to acuminate at both base and apex, (4.5-) 5-7 (-7.5) × (1-) 1.2-2 mm, reddish brown, the scales spreading with maturing achenes; scales 4-8 per spikelet, thin, submembranous, dorsally obtuse to rounded at maturity, upper sterile and lower fertile scales inrolled at anthesis, finely striate, uniformly reddish brown with very fine red lineations, glabrous, margins narrowly scarious, apex acute to acuminate, midcosta fine, pale brown to brown, extending beyond the apex as a short mucro on proximal spikelet scales, antrorsely scabrous distally near tip; fertile scales 2 or 3, terminal scale (staminate or empty) linear-elliptic, otherwise ovate-elliptic to widely ovate-elliptic, 4-5.6 × 1.8-3.8 mm; sterile scales 2-5, ovate to very widely ovate, 1.3-4.2 × 1.2-3 mm. Stamens 3 (terminal flower of spikelet often staminate only), the anthers 2.3-3.5 mm long, subulate-tipped with crystalline prickles at apex, truncate with crystalline prickles at base; style entire to shortly bi-lobed at tip, long-exserted beyond apex of subtending scale, curling distally. Achene biconvex, obtrullate or obovate, 2.3-3.3 × 1.7-2 mm, transversely rugulose, papillate, brown to dark brown, dull, cuneate to base, subacute at apex, the margins thickened with constrictions and protuberances; epidermal cells isodiametric, rounded, buttressed, central nodules evident; style base slightly wider and thicker than achene body, triangular with acuminate apex and 2-lobed sagittate base, 3-4.3 mm long, 1.7-2.1 mm wide at base, finely antrorsely scabrous (at least distally) spongy-thickened, brown, semi-glossy, with longitudinal medial groove on both sides that is often whitish at bottom of declivity; bristles 6, fine, subulate, up to 5 mm long, typically exceeding achene body and $^{2}/_{3}$ length of style base, but sometimes 1 or 2 shorter than achene body, reddish, finely antrorsely barbed with blackish barbs.

Distribution: Pantropical. Mexico, Central America (Guatemala, Honduras, Nicaragua, Costa Rica, and Panama), West Indies (Cuba, Hispaniola, Jamaica, Puerto Rico), Trinidad, South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, Paraguay, Uruguay, Peru, Bolivia, Argentina), Africa, Madagascar, India, Malesia, Australia, New Guinea, and Pacific Islands.

Habitat in the Guianas: In lowlands, often rooted in shallow water or on floating mats of vegetation of swamps, margins of creeks and rivers, shallow canals, drainage ditches, seasonally flooded savannas, margins of agricultural fields, pastures, rice fields, secondary forest, mangrove strand, secondary vegetation, and disturbed areas, 0-300 m.

Specimens examined: FRENCH GUIANA: Cayenne, without date, *M. Leprieur s.n.* (G); Without locality, 1819-1821, *M. Poiteau s.n.* (G); Without locality, Jul 1824, *M. Poiteau s.n.* (K); Crique Jacques sur la Mana, 28 Jul 1955, *J.J. Hoock s.n.* (P); Dégrad Fourgassié, sur la riviére Orapu (affluent de la riviére Comté), rive droite, 5 km en amont du confluence, 12 Feb 1978, *A. Raynal-Roques 20027* (CAY); Roura, berge du fleuve Mahury, ar débarcadère du bac, 25 Feb 1978, *A. Raynal-Roques 20143* (CAY, P-2); Mana, grand marais peu avant Crique-Jacques, sur la route de St. Laurent, à 4à 6 km de Mana vers l'W, 14 Mar 1978, *A. Raynal-Roques 20209* (CAY, P-2); Cayenne, route du Tour de l'Ile, PK 10 dans un marécage, 3 Aug 1982, *A. Fournet 237* (CAY, NY, P); Cayenne, route du Tour de I'Ile, à 500 m du Pont de la Rivière, dans un marécage, 6 Aug 1982, *A. Fournet 248* (CAY, P); Marécages entre St. Laurent et Mana, 15 Feb 1983, *G. Cremers 8013* (CAY, NY, P); Piste de St. Elie, CD-21, km 15.7, 100 m, 05°00'N, 53°10'W, 15 Sep 1987, *W. Hahn 3724* (CAY, NY, P, U, US); Jacques Creek, Bassin de la Mana, 10 m, 05°37'N, 53°48'W, 13 Apr 1989, *G. Cremers & M. Hoff 10513* (NY); Pri pri Cabassou, Ile de Cayenne, 5 m, 20 Oct 1989, *M. Hoff 5730* (B, CAY, NY). GUYANA: Without locality, 1867, *W. Parker s.n.* (K); Demerara [Georgetown?], 1867, *W. Parker s.n.* (K); Without locality, Sep-Oct 1881, *G.S. Jenman 1495* (K, P); New Amsterdam, Berbice, 0-2 m, Dec 1888, *G.S. Jenman 4604* (BRG, K); Lamaha Canal, Oct 1889, *G.S. Jenman 4553* (BRG, K, NY, U); Ituribisci Lake, Essequibo, Jun 1904, *Herbarium 103* (K-2); Baramanni, Waini River (short cut), Jul 1906, *J.E. Beckett 8519* (K); Government Industrial School, Essequibo, botanical survey pasture lands, 10 May 1910, *Forestry Department British Guiana s.n.* (BRG); Parika, 18 mi. W of Georgetown, on Essequibo River, 14 Nov 1919, *A.S. Hitchcock 16744* (NY, US); Georgetown, SE of, East Coast Water Conservancy; canal SE of Lamaha Stop-off, 27 Nov 1919, *A.S. Hitchcock 16995* (NY, US); Akyma, Demerara River above Wismar, 9 Jan 1920, *A.S. Hitchcock 17417* (NY, US); Kabakaburi,

10 Feb 1923, *J.S. de la Cruz 3245* (NY, US); Coomacka, Demerara River, May 1923, *A.C. Persaud 283* (F-2); Without locality, 14 Feb 1924, *D.H. Linder 68* (NY); Moruka Savanna, Sep 1929, E.B. Martyn 152 (K); Canal No. 1, West Bank Demerara, 0-25 m, 20 Sep 1951, *Forestry Department British Guiana 6440* (K, NY, U); Boerasirie area, W part, 5-25 mi. W of Georgetown, 0-3 m, 2 Sep 1955, *E.L. Little Jr. 16787* (US); Boerasirie area, 5-25 miles West of Georgetown, 0-3 m, 13 Oct 1955, *E.L. Little Jr. 16846* (NY, US), *16850b* (US); Mahaicony-Abary rice area, E bank Demerara River, about 35 mi. SE of Georgetown, 0-3 m, 14 Oct 1955, *E.L. Little Jr. 16852* (US); Coast region, C.A.S. Mon Repos, East Coast Demerara, 0 m, 15 Mar 1958, *S.G. Harrison 505* (BRG, K-2); Cane Grove Land Settlement, East Coast Demerara, 24 Sep 1958, *S.G. Harrison 1575* (BRG, K, NY); Orinduik, near crossing to Brazil, 7 Nov 1959, *V. Graham s.n.* (K); Abary River, 0-2 m, Nov 1978, *A.D. McKay 28* (K); Area W of Demerara River, N and S of Wales, 06°40'N, 58°11'W, 0 m, 4 Dec 1986, *J.J. Pipoly & M.H. Ameer 9102* (B, CAY, NY, US); Naamryck Canal, ± 8 km SE of Naamryck Public Rd, just W of Lookout village, 06°50'N, 58°25'W, 0 m, 31 Mar 1987, *J.J. Pipoly 11260* (CAY, NY, US); Near Mahaica village, dikes and water reservoir, 06°38'N, 57°54'W, 0-3 m, 22 Oct 1987, *L.P. Kvist et al. 377* (B, BM, CAY, P, U, US); Along west bank of the canal between St. Lawrence and Hubu, 06°49'N, 58°28'W, 0-2 m, 19 Oct 1989, *C.L. Kelloff et al. 629* (CAY, NY, US); To East Demerara Water Conservancy, Lama Creek, 06°40'N, 58°00'W, 0-12 m, 9 Mar 1991, *T.D. McDowell et al. 4166* (NY, US); Port Kaituma, 1 km to SE of town along trail, 07°43'N, 59°52'W, 15-20 m, 14 Dec 1991, *B. Hoffman & C. Capellaro 598* (NY, US); W bank of Demerara River, 12 km S of pontoon bridge across River; S of Wales, 06°40'N, 58°15'W, 0-10 m, 25 Oct 1996, *C.N. Horn & J. Wiersema 11100* (US). GUYANA or SURINAME: Without locality, 1843, *F.W.R. Hostmann 840* (BM, G). SURINAME: Groningen, without date, *F. Voltz s.n.* (U); Paramaribo and vicinity, without date, *H.C. Focke 118* (U); 1841, *F.W.R. Hostmann 78* (K); Para, Feb-Apr 1844, *A. Kappler 1558* (G, P); Commetewane Rivier, 30 Jul 1913, *Soepra[p]ta 9* (U); Suriname Rivier, Plant, Guineesshe Vriendsclep, 23 Aug 1913, *H. Uittien 285* (K); Suriname Rivier, 23 Aug 1922, *Soepra[p]ta 285* (U); Cottica Rivier near Moengo, 9 Aug 1933, *J. Lanjouw 387* (NY, U); Coronie, 23 Oct 1933, *J. Lanjouw 1112* (K, U); Doorsteek, Nickerie, Nanni Kreek, 2 Oct 1941, *D.G. Geyskes 122* (NY, U); Cottica Rivier, Barbakoeba Kreek, 10 Jun 1942, *D.G. Geyskes s.n.* (U); Wiawia Bank ad Grote Zwiebel swamp, 19 Feb 1948, *J. Lanjouw & J.C. Lindeman 1170* (NY, U); Coronie, 13 Jun 1948, *D.C. Geijskes s.n.* (U, US); Via secta ab Wiawia Bank ad Grote Zwiebelzwamp, 11 Nov 1948, *J.C. Lindeman 1170* (K); Wiawia Bank ad Grote Zwiebel swamp, 23 Nov 1948, *J. Lanjouw & J.C. Lindeman 1235* (U); Coppename fluv. ostium et Coronie oppidum Tweed swamp, 20 Dec 1948, *J. Lanjouw & J.C. Lindeman 1496* (U); Coppename fluv. ostium et Coronie oppidum Tweed swamp, 16 Dec 1948, *J. Lanjouw & J.C. Lindeman 1412* (U); Wiawia Bank ad Grote Zwiebel swamp, 23 Nov 1948, *J. Lanjouw & J.C. Lindeman 1234* (U); Nickerie, Zwamp tussen Hampton Court en Henarpolder, 8 May 1949, *J. Lanjouw & J.C. Lindeman 3174* (NY, U); Nickerie, Zwamp Z van Nickerie Rivier bij Post Utrecht, 15 May 1949, *J. Lanjouw & J.C. Lindeman 3415* (NY, U);Nickerie, in Nanni Kreek, 10 May 1949, *J. Lanjouw & J.C. Lindeman 3223* (U); Nickerie, along Nanni Kreek, 19 Jun 1951, *D.G. Geyskes 109* (F, U); Maengo, veebedrijf, 22 May 1955, *Ir J.G.P. Dirven LP549* (U); Zuid van Paramaribo, 1958!, *Ir J.G.P. Dirven 651* (U); In vicinitate fluminis Commewijne inferioris, 50 km ZO v.Paramaribo, 17 May 1961, *W.H.A. Hekking 814* (U); Calcutta, km 68, 14 Sep 1962, *T.W. Reijenga 185* (U); Commewijne, Suriname Rivier, Zuidzijde EW, 9 Apr 1963, *T.W. Reijenga 184* (U); Nieuw Caledonie, km 84.5, Saramacca Rivier, District Saramacca, 17 Apr 1963, *T.W. Reijenga 183* (U); Jarikaba swamp, N of Hamburg in Uitkijk, 14 Feb 1964, *T.W. Reijenga 224* (U); Cupido en Bigi Bere Kreek, District Nickerie, 22 Apr 1964, *T.W. Reijenga 773* (U); Sipaliwini Savanne area on Brazilian frontier, 300 m, 27 Sep 1968, *F.H.F. Oldenburger et al ON195* (NY); Sipaliwini Savanne area on Brazilian frontier, W of 4-Gebroeders Mountains, 300 m, 27 Sep 1968, *F.H.F. Oldenburger et al. 195* (U); Sipaliwini Savanne area on Brazilian frontier, loc. Little Sipaliwini savanne, 280 m, 3 Jan 1969, *F.H.F. Oldenburger et al. 753* (U); Sipaliwini Savanne area on Brazilian frontier, S Sipaliwini, 19 Jan 1970, *F.H.F. Oldenburger et al. 1024* (NY, U); Santo-Boma-Project, Leiding 16, Paramaribo-Uitkijk, 20 Dec 1968, *T.W. Reijenga 590* (U); Kruid, 1.5 m hoog [Wia Wia Reserve], 16 Aug

1971, *T.R. Narain LBB 13765* (U); Monkshoop, 7 km ten W van, N Saramacca, 22 Feb 1975, *P.A. Teunissen LLB 15091* (U).

26. Rhynchospora curvula Griseb., Fl. Brit. W. I. 574. 1864, non (Nees) Boeckeler, 1873. TYPE: Trinidad, *Lockhart 299* (holotype: K; isotype: NY!). Figs. 18, 54C-D.

Rhynchospora scapigera Boeck., Linnaea 38: 402. 1874. TYPE: French Guiana; Cayenne, *Jelski s.n.* (holotype: B, destroyed; isotype: GH).

Caespitose perennial, 4-25 cm tall; rhizome short, scarcely evident; roots coarse, to 1 mm wide; sheathing base of culm 0.5-1 mm wide. Culms slender, ascending, reflexed with age, 0.3-0.6 mm wide, trigonous, channeled along one side, slightly expanded and thickened at apex just below inflorescence, stiff but flexuous, coarsely ribbed, light green, glabrous. Leaves spreading, often curvate with age, 2-5 per culm, primarily basal, 1 or 2 lower cauline, 1-8 cm long; sheaths eligulate, broadened at base (often abruptly so), thickly herbaceous, coarsely ribbed, light green to stramineous, glabrous, the inner band membranous, cellular-reticulate, concave to truncate at orifice; blades linear-lanceolate, 0.3-1.4 mm wide, flattened to broadly V-shaped or subplicate, stiff, thickly herbaceous, smooth and glossy adaxially, finely veined abaxially with a distinct and strongly elevated, antrorsely scabrous midcosta, green adaxially with light green margins, light green abaxially, glabrous, margins bluntly antrorsely scabrous, often remotely so, attenuate to a blunt triquetrous or subflattened tip. Inflorescence a single congested head-like fascicle of (1-) 2-10 (-15), ascending to spreading spikelets at the summit of the culm, 5-8 × 3-10 (-13) mm;

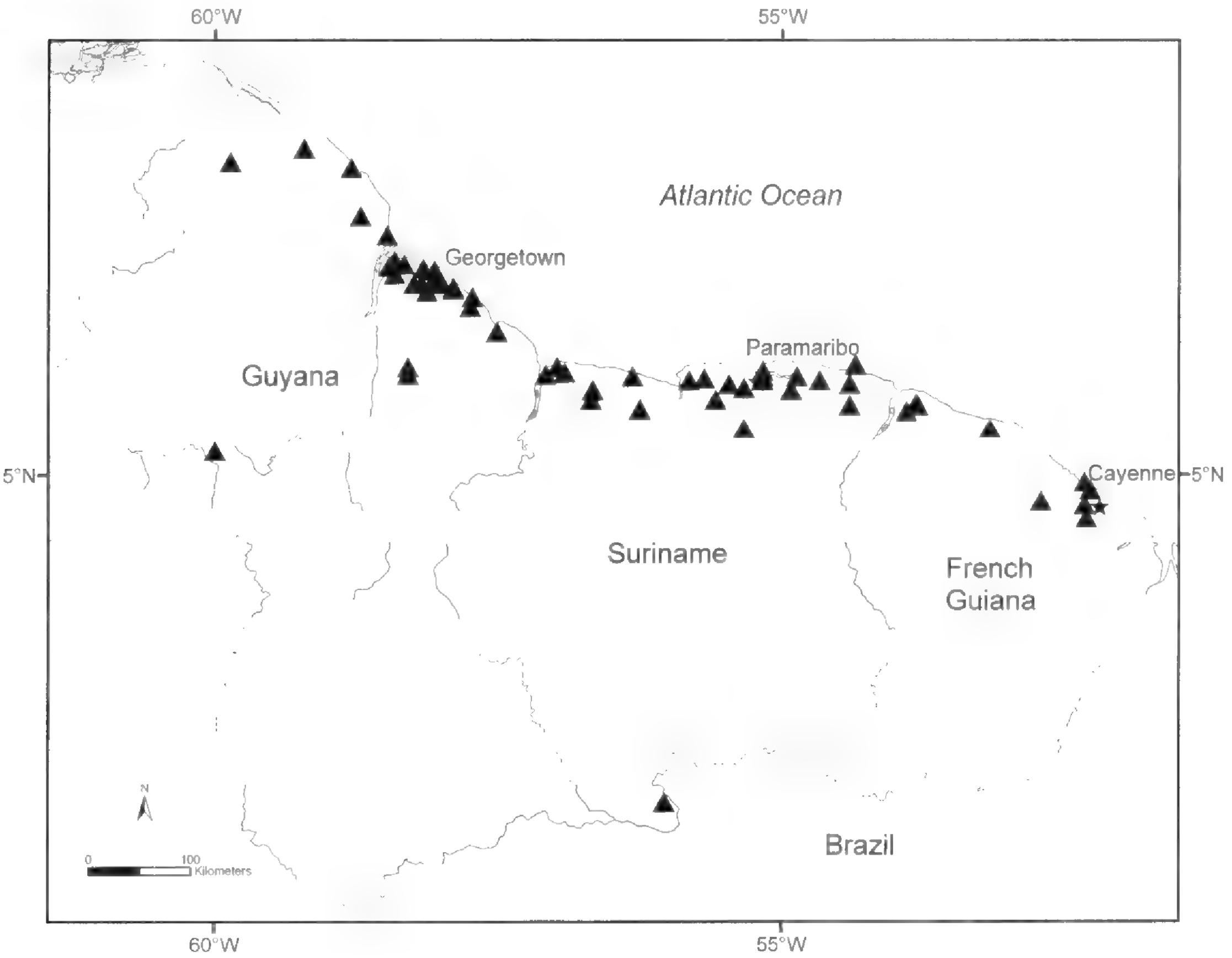

Fig. 17. Distribution of *Rhynchospora corymbosa* in the Guianas.

involucral bracts 3-5, scale-like, not imbricately arranged, shorter than the inflorescence, shortly awned, the awns flattened, thickened, with an obtuse to rounded tip; branches not evident; bracts at base of spikelets with a ciliate-scabrous keel; spikelets slenderly ovoid-lanceoloid, (3.8-) 4-6.5 (-7) × 0.7-1.1 mm, cuneate at base, acuminate at apex; scales 8 or 9 per spikelet, dorsally obtuse to rounded, stiff, thickly herbaceous except for terminal scales of spikelet which are thinly herbaceous to submembranous, smooth, semi-glossy, green, often black or brown-black proximally on sides of the longest fertile scale, glabrous, margins narrowly scarious, midcosta indistinct, very fine, pale, prolonged beyond the acute to acuminate or attenuate apex; fertile scales 3 or 4, spirally arranged, ovate-lanceolate to lanceolate, (3-) 3.5-5.5 × 1.6-2.2 mm; sterile scales 5, distichous, ovate to widely ovate, 0.8-2.5 × 0.8-1.8 mm. Stamens 3 (terminal flower of spikelet often staminate only), the anthers 2-2.5 mm long, truncate at base, apiculate at apex; style entire, shortly exserted beyond apex of subtending scale. Achenes 2-sided, abaxially (dorsally) convex, adaxially concave with a wide medial longitudinal ridge, oblanceolate-obovate, 1.8-2.3 × 0.6-1 mm, acuminate at base, rounded at apex, minutely punctate, with rounded to club-shaped nipple-like projections on both sides at apex, light green to green; epidermal cells isodiametric with 1 or 2 low farinaceous nodules; style base flattened-conic, 0.4 mm long, 0.2-0.3 mm wide at its base, soft, crusty, light brown; bristles 5 or 6, subulate, antrorsely barbed distally, plumose proximally with silvery-silky ascending hairs, the two lateral ones elongate, nearly twice as long as achene, to 4 mm long, the other 3 or 4 equaling to slightly exceeding length of achene.

Distribution: Central America (Honduras and Nicaragua), Trinidad, and South America (Colombia, Venezuela, Guyana, Suriname, French Guiana).

Habitat in the Guianas: In lowlands, often in damp or wet sands of savannas and white-sand savannas, 5-400 m.

Specimens examined: FRENCH GUIANA: Cayenne, without date, *J. Martin 318* (BM); Without locality or date, *M. Leprieur s.n.* (G, P); Cayenne, 1835, *M. Leprieur s.n.* (G); Transect no 12, Savanna de Kourou, 29 Aug 1962, *J.J. Hoock s.n.* (P, U); Savane Matiti, 32 km WNW du bac de Macouria, W de Cayenne, 18 Mar 1976, *A. Raynal-Roques 18712* (P-2, US); Savane du Gallion, 20 km SSE of Cayenne, 4 Mar 1976, *A. Raynal-Roques & C. Tirel 18440* (P-2, US); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 10 Mar 1977, *Y. Veyret & G. Cremers 4425* (CAY, FTG, P-2); Savane de Corossony, sur la piste de St. Elie, 4 à 7 km à l'WSW de Sinnamary, 22 Dec 1977, *A. Raynal-Roques 19699* (CAY, P-2); Savane de Corossony, PK 111 de la route Cayenne-St. Laurent, 5 m, 12 Dec 1986, *G. Cremers 9559* (CAY, P); Savane de Corossony, Piste de Sainte-Élie, 10 m, 05°23'N, 53°00'W, 8 Feb 1988, *M. Philippe 72* (CAY); Savane des Singes, Région littorale, S.SW Kourou, 20 m, 05°05'N, 52°42'W, 9 Jun 1989, *G. Cremers & M. Hoff 10642* (CAY); Savane des Singes, Région littorale, SSW Kourou, 20 m, 05°05'N, 52°42'W, 9 Jun 1989, *G. Cremers & M. Hoff 10682* (NY); Savane Diane 2, 05°15'00"N, 52°48'29"W, 2 Feb 1995, *L. Cadamuro & Solacroup 61* (CAY). GUYANA: Kaieteur savanna, ca. 1200 ft, 9 Sep 1937, *N.Y. Sandwith 1445* (K, U); Kaieteur Plateau, Potaro River, 300-400 m, 8 May 1944, *B. Maguire & D.B. Fanshawe 23312* (F, K, P, U, US); Soesdyke, Oct 1973, *A. Cooper 325* (BRG, U); Gunn's, Essequibo River, 240-260 m, 26 Sep 1989, *M.J. Jansen-Jacobs et al. 1838* (B, CAY, F, K, MO, U, US); Mountain Point,110 m, 13 Jun 1995, *M.J. Jansen-Jacobs et al. 4049* (NY, U, US). SURINAME: Near Brownsweg, 13 Nov 1933, *J. Lanjouw 1268* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp, savanne bij km 13.9, 12 Oct 1948, *J. Lanjouw & J.C. Lindeman 794* (K, U); Moengo tapoe ad Grote Zwiebel Swamp, 29 Sep 1948, *J. Lanjouw & J.C. Lindeman 554* (U); Moengo tapoe ad Grote Zwiebel swamp, 1 Oct 1948, *J. Lanjouw & J.C. Lindeman 705* (U); Moengo tapoe ad Grote Zwiebel swamp, 12 Oct 1948, *J. Lanjouw & J.C. Lindeman 792* (U); Zanderij I, 19 Mar 1951, *D.G. Geyskes 82* (U); Prope Jodensavanne (fluv. Suriname), 3 Jun 1957, *P.C. Heyligers 789* (U); Gros Savanne (prope km 103), opn.311, 8 Apr 1959, *J. van Donselaar 699* (U); Kappel Savanne prope pedem astralem montis Tafelberg, ca 300 m, 16 Feb 1961, *K.U. Kramer & W.H.A. Hekking 3282* (U); Kappel Savanne, prope pedem australem montis Tagelberg, ca. 300 m, 15 Feb 1961, *K.U. Kramer & W.H.A. Hekking 2905* (U); W-oever van Maratahha by Saparra Kreek, 8 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3219b* (U); 2-3 km S of Saparra Kreek, Maratakka O-oever, 28 May 1965,

P.J.M. Maas & J.A. Tawjoeran 3332 (U); Van Maratahha, ca. 5 km boven Saparra Kreek, 27 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3300* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 2 Sep 1967, *J.T. Wildschut & P.A. Teunissen11600* (U); sabanpasi-savanne-complex, 25 Sep 1967, P.A. *Teunissen & J.T. Wildschut LBB 11797* (U); Sipaliwini Savanne area on Brazilian frontier, S of Sipaliwini airstrip, 22 Jan 1969, *F.H.F. Oldenburger et al. 964* (U); near Matta, Aug 1976, *R. Jansma LBB 15903* (U); Zanderij Savanne, Feb 1976, *R. Jansma LBB 15642* (U).

27. Rhynchospora dentinux C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 33. 1908. TYPE: Venezuela; Maypures, Upper Orinoco, *Spruce 3614* (holotype: K!; isotype: P). Figs. 21, 54A-B.

Caespitose perennial, 5-40 cm tall; rhizome short, scarcely evident; roots medium to coarse, 0.4-1 mm in diam.; sheathing base of culm 2-8 mm wide. Culms slender, ascending, arching with age, 0.4-0.8 (-1) mm wide, trigonous, channeled along one side, slightly expanded and thickened at apex just below inflorescence, flexuous, finely ribbed, green, glabrous. Leaves spreading, often curvate with age, numerous, primarily basal, 1 or 2 lower cauline, 2-25 cm long; sheaths eligulate, broadened at base (often abruptly so), thickly herbaceous, coarsely ribbed, green, glabrous, the inner band broad, membranous, distinctly very finely cellular-reticulate, readily splitting and spreading apart, concave to truncate at orifice; blades linear, 0.6-2.2 (-2.8) mm wide, broadly V-shaped to U-shaped or subinvolute, stiffly herbaceous, cellular-reticulate, smooth and semi-glossy adaxially, finely veined abaxially, green, glabrous, margins remotely long-ciliate, long-attenuate to a blunt, scabrous-ciliate, triquetrous or subflattened tip. Inflorescence a single congested, head-like, obconic to hemispherical fascicle of (1-) 2-20 (-30) ascending to spreading spikelets at the summit of the culm, 7-12 × 6-18 mm; involucral bracts 3-6, short, scale-like, not imbricately arranged, shorter than the inflorescence or the lowermost sometimes equaling to shortly exceeding the inflorescence; branches not evident; spikelets ovate-lanceolate, often slightly falcate, (5-) 6-9.5 (-10) × 1.5-2.3 mm, cuneate at base, acuminate at apex; scales 7 or 8 per spikelet, dorsally acute to obtuse, medial scales of rachilla with a short limb, thickly herbaceous except for terminal scales of spikelet which are thinly herbaceous to submembranous, smooth, semi-glossy to glossy, uniformly yellowish brown, glabrous, margins narrowly scarious to not evidently so, midcosta indistinct, very fine, pale, prolonged beyond the acute apex; fertile scales 4 or 5, ovate-elliptic to ovate-lanceolate except for terminal ones which are lanceolate to linear-lanceolate and about 1 mm wide, 4.5-7.5 (-8) × 2-3.3 mm; sterile scales 3, sometimes subdistichous towards base, ovate to widely ovate or ovate-elliptic, 1.2-3 (-3.3) × 1.5-2.5 mm. Stamens 3 (terminal 2 or 3 flowers of spikelet staminate only), the anthers 2.5-3.5 mm long, cuneate at base, apiculate at apex, stipitate, the filaments often fused or adherent to each other in terminal staminate flowers of spikelet, free only at apex; style entire or shortly bifid at tip, often long-exserted and curling beyond apex of subtending scale. Achene 2-sided, involute, inrolled towards the adaxial side, with sinuate-corrugate (toothed) margins, abaxially (dorsally) obtuse to rounded, lanceolate, 3-4 × 0.7-1.3 mm, cuneate at base, confluent with style base at apex, minutely punctate, with rounded to club-shaped nipple-like projections on both sides at apex, pale brown to brown, dark brown to blackish at maturity; epidermal cells isodiametric with short-conic central nodules; style base subflattened or widely U-shaped in cross section, lanceolate to lanceolate-attenuate, (1.3-) 1.6-2.3 mm long, 0.3-0.7 mm wide at its base, thin, brittle, pale brown to brown; bristles 5 or 6, subulate, finely antrorsely barbed, plumose proximally with tawny ascending hairs, reddish, exceeding length of achene, equaling to slightly exceeding tip of style base.

Distribution: South America (Colombia, Venezuela, and French Guiana).

Habitat in the Guianas: Granite inselbergs in "savane roche" (rock savanna) communities, 180-350 m.

Specimens examined: FRENCH GUIANA: Haut Oyapock, Mont St. Marcel, 300-350 m, 30 Jul 1975, *J.J. de Granville 2600* (CAY); Roche Touatou, Bassin de L'Oyapock, versant sud du Mont Touatou, 180 m, 15 May 1995, *G. Cremers & J.J. de Granville 13979* (CAY-2, P, US). Mont Saint-Marcel, zone sud-est du massif, 300 m, 02°23'00"N, 53°00'20"W, 18 Jul 2002, *J.J. de Granville et al. 15324* (CAY, NY, P, US).

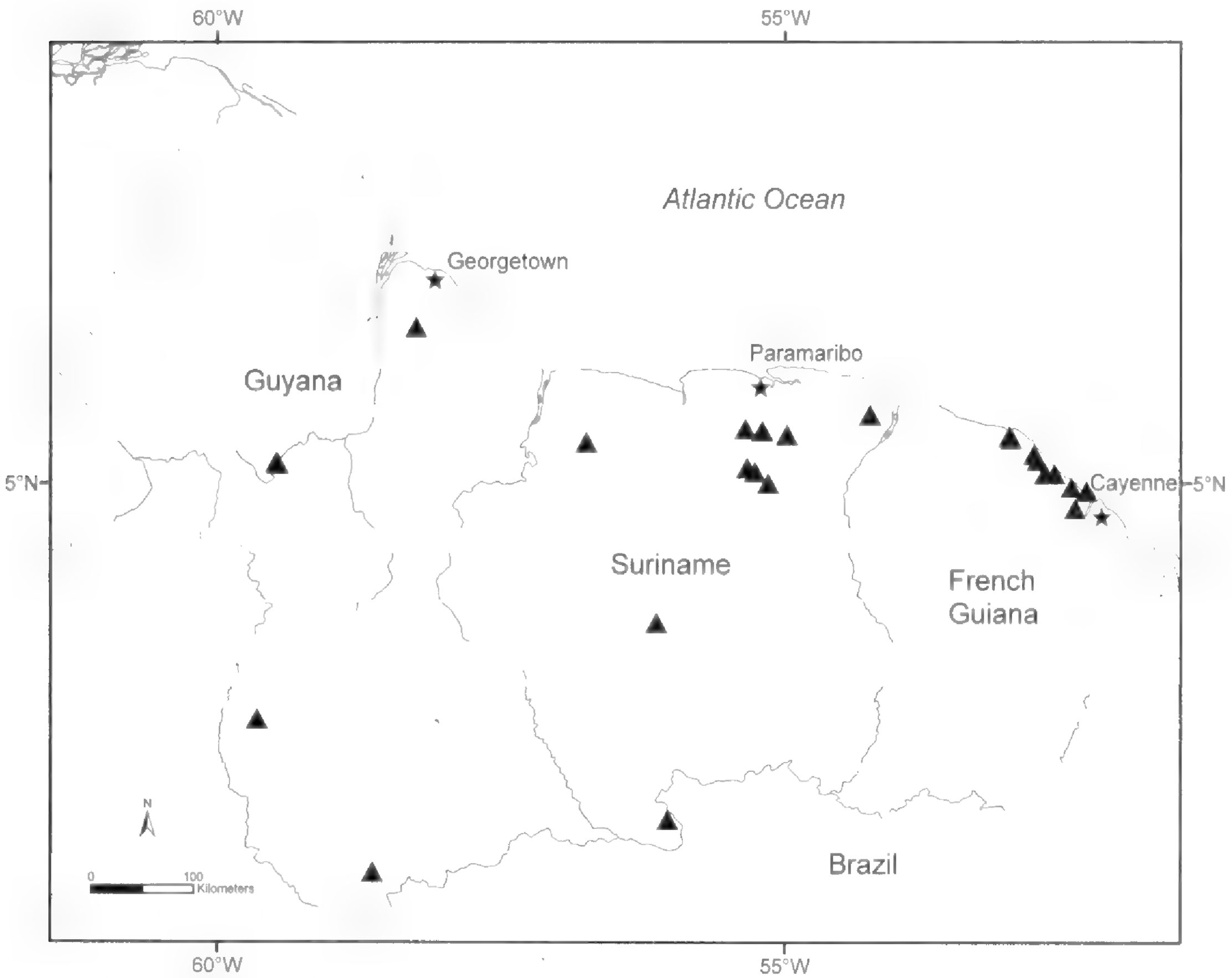

Fig. 18. Distribution of *Rhynchospora curvula* in the Guianas.

28. Rhynchospora divaricata (Ham.) M. T. Strong in M.T. Strong & P. Acevedo-Rodríguez, Contr. U. S. Natl. Herb. 52: 343. 2005. *Fimbristylis divaricata* Ham., Prodr. Pl. Ind. Occid. 14. 1825. TYPE: Puerto Rico. *Ledrú s.n.* (holotype: P-Desv.!). Figs. 19, 21, 78E-F.

Rhynchospora trichodes C. B. Clarke in Urban, Symb. Antill. 2: 116. 1900. *Schoenus hispidulus* Vahl, Enum. Pl. 2: 219. 1805. *Dichromena hispidula* (Vahl) Kunth, Enum. Pl. 2: 279. 1837. *Haloschoenus hispidulus* (Vahl) Nees in Martius, Fl. Bras. 2(1): 124. 1842. *Rhynchospora hispidula* (Vahl) Boeck., Linnaea 37: 604. 1873, non Grisebach, 1866. TYPE: French Guiana, *coll. ign.* (holotype: B, destroyed, photo US ex B).

Fimbristylis hirsuta Hochst. ex Steud., Syn. Pl. Glumac. 2: 116. 1855. TYPE: Suriname, *Hostmann 1127* (holotype: P; isotypes: BM-2!, G-2!, MO!, P).

Rhynchospora hispidula var. *major* Kük., Bot. Jahrb. Syst. 75: 179. 1950. TYPE: Brazil; Pará, Ilha de Marajó, *Schwacke 205* (holotype: B, destroyed).

Caespitose annual, 10-50 cm tall; roots fine to medium. Culms ascending, (0.5-) 0.6-3 mm wide, trigonous or subtriquetrous, often with obtuse angles, somewhat firm, flexible, longitudinally channeled along one side medially, finely ribbed, green, pilose. Leaves 3-6, ascending, basal and cauline, 12-40 cm long; sheaths eligulate, subinflated, loosely surrounding culms, finely veined, coarsely pilose to subglabrate, inner band membranous on proximal sheaths, only the orifice membranous on distal sheaths, the orifice concave, long-pilose on margin; blades flattened or folded, (1.5-) 2-5 mm wide, finely veined, green, glabrate, margins and abaxial midvein pilose. Inflorescence a terminal and 1 or 2 lateral lax, compound,

corymbose partial panicles from the upper leaf-like bracts which may elongate to 23 cm; prophyllar bracts often subtending a sterile axillary spikelet; partial panicles very variable in size, particularly in width, 3.5-20 × (3-) 5-20 cm; branches and branchlets compressed-trigonous or subterete in cross section, pilose to glabrous, coarsely ribbed with pale green ribs, primary branches and spikelet pedicels often strongly reflexed or recurved at maturity, the lowermost primary branches often greatly elongating up to 15 cm; spikelets borne singly at tips of branches or secondary and tertiary branchlets, often nodding, broadly ovoid to globose, 3.2-4.5 × 2.3-4 mm, obtuse or broadly acute at apex, the scales spreading with developing achenes; scales 11-48 per spikelet, submembranous, dorsally obtuse to rounded, glabrous, brown, reddish brown lineolate, margins broadly scarious, midcosta very slender, brown, inconspicuous, the tip pilose or glabrate, shorter than to equaling obtuse to rounded apex of scale, distal fertile scales membranous, translucent; fertile scales 9-45, broadly ovate, circular, oblate, subrhombic, or ovate to oblong-ovate (distal scales), 2.3-3 × 1.2-3 mm; sterile scales 2 or 3, ovate, 1.5-2 × 1.2-2 mm. Stamens 3, the anthers 0.8-1.2 mm long, with a prickly apiculus bearing crystalline trichomes at apex, truncate and minutely papillate at base; style 2-branched, equaling or 1 and ½ times length of unbranhced portion. Achene biconvex, oblate-obovate to transversely elliptic-obovate, wider than long, 1-1.4 × 1.2-1.5 mm, gradually rounded at apex, truncate at base with 2 lateral rounded swellings on either side of the short 0.2-0.4 mm long strap-shaped stipitate base, transversely rugose, shiny, pale brown to dark brown or blackish at maturity; epidermal cells linear, vertically oriented; style base depressed-triangular or lunate, 0.3-0.5 mm long and as wide as achene, 2-lobed, the lobes extending down along margins of achene to about the middle; bristles absent.

Distribution: Central America (Honduras, Nicaragua, Panama, and Costa Rica), Trinidad, and northern South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: Sand and sandy clay savannas, 30-130 m.

Note: An earlier described name discovered for this species, *Fimbristylis divaricata* Ham., has priority over *Rhynchospora trichodes* C. B. Clarke, a new name that was coined for the illegitimate homonym, *R. hispidula* (Vahl) Boeck. A transfer from *Fimbristylis* to *Rhynchospora* is thus necessary. The locality of the type specimen of *Fimbristylis divaricata* is questionable. The type of *Rhynchospora hispidula* is from French Guiana and no other record of this species exists from Puerto Rico or anywhere else in the West Indies. However, this species is known from Trinidad and the collector, Ledru, was known to have collected on that island. This suggests that the type specimen may perhaps be mislabeled.

Specimens examined: French Guiana: Cayenne, 1820, *coll. ign. 3374* (B, US-photo); Without locality, Jul 1824, *M. Poiteau s.n.* (K); Cayenne, 1835, *M. Leprieur s.n.* (G-2); Cayenne, 1835, *M. Leprieur 80* (G); 1819-1821, *M. Poiteau s.n.* (G-2, P); Cayenne, 1840, *M. Leprieur s.n.* (G); Cayenne, 1859!, *P. Sagot 1352* (BM, G, K, P); vicinity of Cayenne, hill above Grant's Road, Matabon, 21 Jun 1921, *W.E. Broadway 544* (US); vicinity of Cayenne, 17 Jul 1921, *W.E. Broadway 849* (US); Route entre Kourou et Sinnamary, PK 92, 13 Aug 1982, *A. Fournet 262* (CAY-2); Crique Cabassou, Ile de Cayenne, 3 m, 04°54'N, 54°18'W, 14 Aug 2002, *J.J. de Granville & F. Crozier 15632* (CAY, GENT, NY, P, US); Guyana: Karanambo, Rupununi River, 5 Sep 1988, *P.J.M. Maas et al. 7285* (B, K, MO, U, US). Suriname: Without locality,1827, *M. Weigelt s.n.* (BM); Without locality, 1854, *F.W.R. Hostmann 1127* (BM, F, G-2,K, P, U); Jodensavanne, without date, *H.C. Focke 1319* (U); near Vier Kinderen, 5 Sep 1948, J. *Lanjouw & J.C. Lindeman 208* (K, U); Omgeving Livorno, langs sloot, 1 Aug 1952, *Ir J.G.P. Dirven LP285* (U); area of Kabalebo Dam project, entrance of jeep trail to Wonotobo at road km 109, 30-130 m, 04°05'N, 57°30'W, 19 Sep 1980, *J.C. Lindeman et al. 483* (K, MO, U, US-2).

29. Rhynchospora donselaarii M. T. Strong, Novon 11: 268. 2001. Type: Suriname; Sipaliwini Savanna; wet valley, 27 Aug. 1966, *J. van Donselaar 3618* (holotype: U sheet # 210087). Figs. 20, 21, 81C-D.

Slender, rhizomatous perennial, 7-21 cm tall; sheathing base of culm 0.8-1.2 mm wide; roots fibrous, brown. Culms slender, ascending, 0.4-0.8 mm wide, trigonous, finely ribbed, smooth, pale green, glabrous, often branching and rooting from lower nodes. Leaves ascending, basal and cauline, the cauline elongate, surpassing the inflorescence,

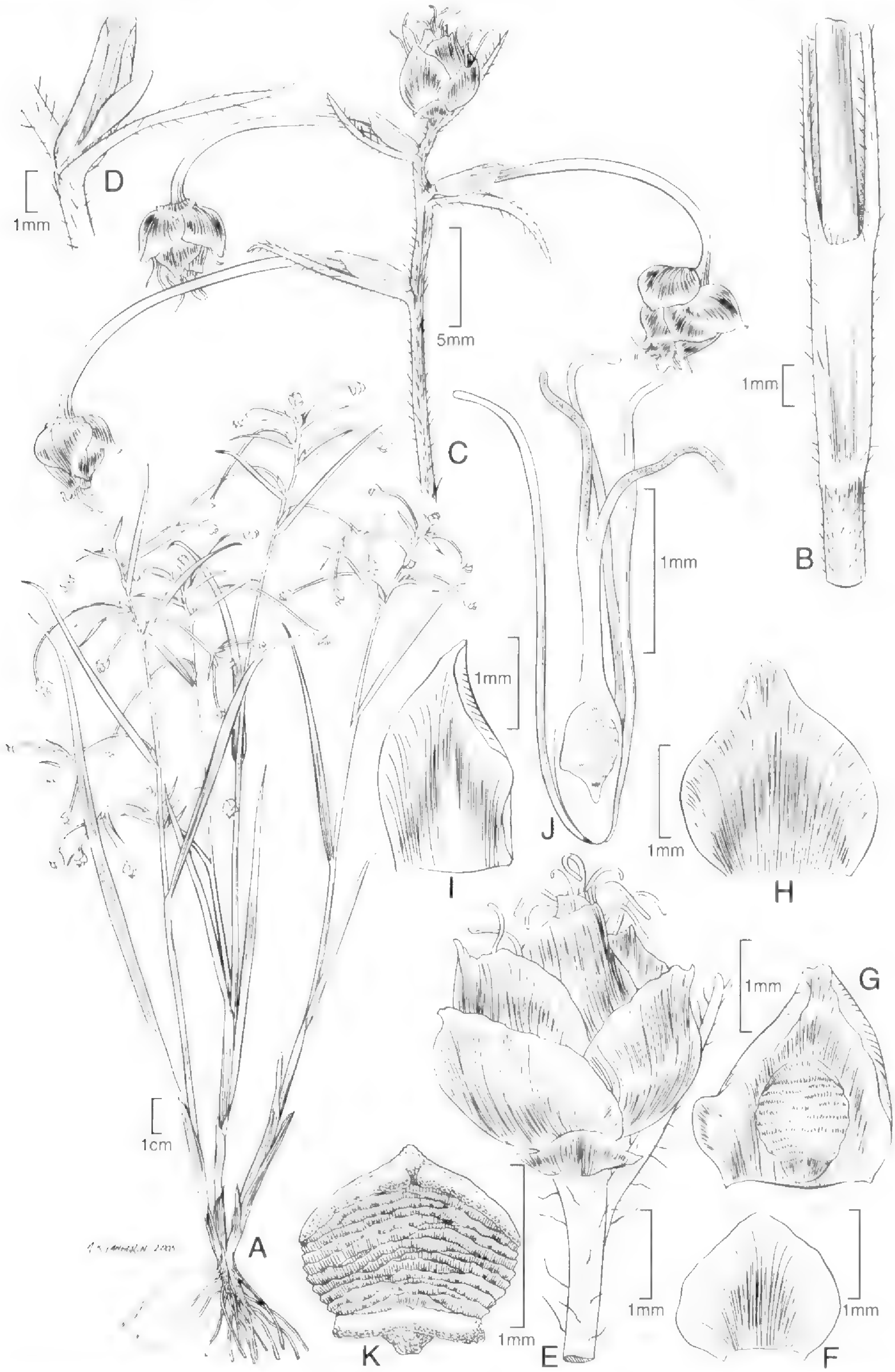

Fig. 19. *Rhynchospora divaricata.* A. Habit. B. Section of culm showing junction of leaf sheath and blade. C. Inflorescence branch showing spikelets. D. Axil of inflorescence branch showing base of spikelet peduncle with prophyll and sterile spikelet. E. Fertile spikelet. F. Sterile basal spikelet scale. G, H. Fertile spikelet scales. I. Upper fertile spikelet scale. J. Floret showing filaments, 2-branched style, and immature achene. K. Achene. (A, from *Anderson 8035*, US and *Maas et al. 7285*, US; B-J, from *Anderson 8035*, US; K, from *Broadway 544*, US).

(0.4-) 5-22 cm long; sheaths finely veined, glabrous, greenish to pale brown, the inner band herbaceous, closed at summit with a membranous U-shaped to truncate, reddish brown orfice, splitting with age; ligule an obscure to very short membranous band at adaxial base of blade (on some blades); blades 0.4-0.7 mm wide (folded), 1.2-1.5 mm wide (unfolded), narrowly V-shaped to longitudinally folded, often tightly folded and appearing flattened and 2-sided, narrowly linear, ascending, long-acuminate to apex, finely veined, smooth, pale green, the margins near apex remotely antrorsely scabrous. Inflorescence (1-) 2 or 3, remote, lax corymbs of 2-several short-pedicelled spikelets, the corymbs 1-2 cm × 5-8 mm; corymb branches trigonous to compressed-trigonous or sometimes 4-sided and rectangular in cross section, glabrous, the branches and spikelet pedicels each subtended by a tubular prophyll and linear-setaceous bract at base, the lowermost bract linear-lanceolate and long-awned, the upper prophyll smaller, ovate, with a notched apex, the spikelets on pedicels 1-10 mm long, borne singly or in fasicles of 2 or 3 at branch tips. Spikelets ovoid-lanceoloid with acuminate apex, pale brown, 2-3 (-4) per corymb, 7-9 × (1.2-) 1.3-2 mm, the scales spreading with maturing achenes; scales 7-9 per spikelet, ovate-lanceolate, narrowly acute to acuminate at apex, sterile basal and lower fertile scales somewhat thickened and coriaceous, pale brown, smooth and sublustrous, with broad scarious margins, upper fertile scales ovate-lanceolate to lanceolate, thin and herbaceous, brown, usually hidden by the lower fertile ones, midcosta pale, very narrow, distinct, prolonged beyond the acute to acuminate apex; fertile scales 3 or 4, subtending 1-2 (-3) bisexual flowers, the distal flowers of a spikelet staminate with abortive pistil, 5-7 × 1-3.2 mm; sterile scales 4 or 5 at base, smaller than the fertile, 2-5 × 1.3-2.6 mm. Stamens 3, the anthers linear, 1.5-2 mm long, apiculate at apex; epidermal cells rectangular, vertically oriented; style 2-branched, glabrous, the stigmas nearly equaling the length of the unbranched portion. Achene shallowly biconvex, ovate to oblong-ovate, 2-2.3 × 1.8-2 mm, pale brown, minutely scrobiculate, with transversely elliptic smooth area medially on each side, this often with a gray longitudinal stripe or patch medially, the base on each side with 2 large dark-colored cavities just above and lateral to the axis of the subsessile to short-stipitate base, the apex 2-lobed, the lobes forming a cup encircling the style base; epidermal cells rectangular and vertically oriented to somewhat isodiametric; style base small, triangular, equaling or shortly exceeding the rim of the apical lobes of the achene; bristles absent.

Distribution: Endemic to Suriname.

Habitat in the Guianas: Known only from the type collection made in the Sipaliwini Savanna.

30. Rhynchospora emaciata (Nees) Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 31: 149. 1869 [1870].

Haloschoenus emaciatus Nees in Martius, Fl. Bras. 2(1): 121. 1842. TYPE: Brazil; "In campis ad urbem S. Pauli et Ypanema prov. S. Pauli, tum in campis ad Villam da Campanha et in deserto ad flumen S. Francisci prov. Minarum," *Martius s.n.* (holotype: M). Figs. 21, 84E-F.

Rhynchospora leptostachya Boeck., Linnaea 37: 591. 1873. TYPE: Brazil, *Sellow s.n.* (holotype: B, destroyed; isotype: P-2).

Caespitose perennial, 22-90 cm tall; rhizome short, curved-ascending; roots medium-sized. Culms strongly ascending to erect, 0.4-1.3 (-1.5) mm wide, filiform, obtusely trigonous to subterete, often channeled along one side distally, somewhat firm, flexuous, easily compressed, medium ribbed, green to pale green, glabrous. Leaves strongly ascending, primarily basal, 1 or 2 lower cauline, 4-57 cm long; sheaths elongate (at least the uppermost basal ones), tight, closely veined, herbaceous to stiffly so, stramineous, glabrous, inner band membranous, cellular-reticulate, often brown- or black-dotted distally, the orifice truncate, cellular-thickened along margin, continuous around adaxial base of blade and forming a short ligular band of tissue; blades filiform, crescentiform-capillary with an adaxial channel or triangular-channeled in cross section proximally, trigonous or compressed-trigonous distally or sometimes V-shaped, 0.3-1 (-1.2) mm wide, somewhat firm, flexuous, closely veined abaxially, smooth, glabrous, margins of channel essentially smooth proximally, attenuate but often articulate towards apex and abruptly compressed or subflattened to tip, the margins above the articulation antrorsely scabrous. Inflorescence a series of 2-4 obpyramidal or hemispherical, open, panicles with elongate lateral branching, the lower panicles successively slightly smaller; terminal

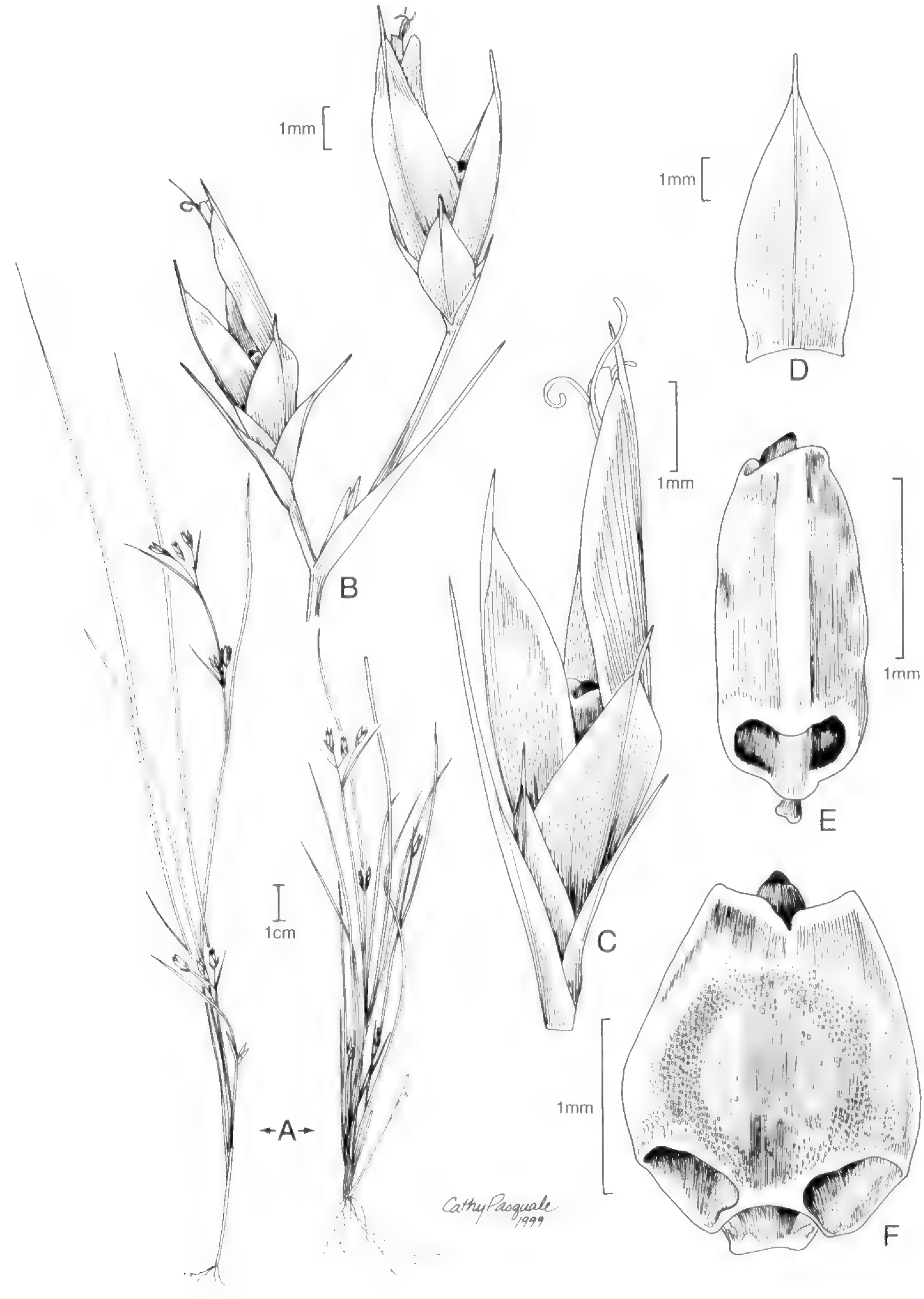

Fig. 20. *Rhynchospora donselaarii.* A. Habit. B. Detail of inflorescence corymb branch with spikelets. C. Spikelet. D. Fertile spikelet scale. E. Achene (lateral view). F. Achene (dorsal view). (A-F, from the holotype, *van Donselaar 3618*, U).

panicle 3-11 × 3.5-11.5 cm, with (9-) 15-93 spikelets; bracts leaf-like but reduced and generally shorter than leaf blades, usually equaling or exceeding subtending partial panicles; lower lateral branches filiform, often weakly ascending or divergent and at right angles to the culm, elongate, 1-4 cm long; spikelets narrowly ellipsoid-lanceoloid, acuminate at base and generally long-acuminate to apex, 4-7.5 (-8) × 0.7-1.3 mm, the scales spreading with developing achenes; scales obtuse to broadly rounded, inrolled but spreading with developing achenes, thinly herbaceous to submembranous, glossy, brown with dark brown or blackish lineations, the fertile scales broadly reddish brown scarious on margins, midcosta distinct only at apex, prolonged beyond the obtuse to acute apex as a short, slightly upcurved awn; fertile scales 4 or 5, ovate-elliptic to ovate-lanceolate (uppermost ones), 2.3-6.2 × 0.7-2.4 mm; sterile scales 3 or 4, ovate or ovate-elliptic, 1-2.8 × 0.5-1.7 mm. Stamens 3, the anthers 1.6-3 mm long, apiculate at apex, truncate and minutely papillate at base; style distinctly 2-branched, the branches 1/3 to twice as long as unbranched portion, exserted well beyond apex of subtending scale. Achene biconvex, subturgid, quadrate-obovate, quadrate, or subrounded, widest at middle, 0.8-1.4 (including stipe) × 0.7-1.2 mm, stipitate, stipe 0.2-0.4 × 0.2-0.3 mm, transversely rugulose, with cellular-reticulate margins, truncate at apex, broadly rounded to subtruncate at base, light brown (when immature), pale brown with a wide, longitudinal gray-brown stripe medially or uniformly gray-brown at maturity; epidermal cells linear, vertically oriented; style base depressed-trigonous, 0.2-0.5 × 0.6-0.9 mm, cellular-crustose, whitish or light brown to brown, shallowly 2-lobed at base, often concave on sides; bristles absent.

Distribution: Central America (Nicaragua and Costa Rica), Trinidad, South America (Colombia, Venezuela, Guyana, Suriname, Brazil, Bolivia, Paraguay, and Argentina).

Habitat in the Guianas: Lowland to upland savanna, 0-1200 m.

Distinguishing features: This species has been included in *Rhynchospora tenuis* by some authors based on similarities in habit and achene features. However, *R. emaciata* can be distinguished from it by its quadrate achene body which bears a distinct stipe at its base, while achenes of *R. tenuis* are obovate and estipitate. Also, *R. emaciata* generally has longer spikelets (4-7.5 (-8) vs. 2.5-5 mm). Cytogenetic studies on these two taxa have shown them to differ in karyotype structure, chromosome size, and chromosome number (2n = 10 in *R. emaciata* vs. 2n = 4 and 8 in *R. tenuis*) (Vanzela et al. 2000).

Specimens examined: GUYANA: Mt. Roraima, Our House (Mt. Roraima Expedition, British Guiana, Oct.-Jan. 1884-85), 20 Dec 1884, *E. Jenman 341* (US); Mt. Roraima, [Our House], Dec 1884, *E.F. im Thurn 341* (BM, K); Lama Savanna, 06°33'N, 57°57'W, Apr 1889, *G.S. Jenman 6141* (K, MO, NY, U, US); SE of Georgetown, East Coast Water Conservancy, Lamaha Stop-Off, 27 Nov 1919, *A.S. Hitchcock 17008, 17009* (US); Rupununi savanna, Feb-Mar 1952, *Ir J.G.P. Dirven LP188* (U); Mahaicony-Abary rice area, ca. 35 mi. SE of Georgetown, <10 ft, 19 Oct 1955, *E.L. Little Jr. 16918* (US); Rupununi Northern Savanna, stand 42, Lake Amucu Yupukarri, ca. 350 ft, 15 Oct 1963, *R.J.A. Goodland 995* (NY); Pakaraima Mountains, between Koatse River and Chenoweing Village, 05°27'N, 60°04'W, 700-800 m, 12 Nov 1992, *B. Hoffman & T. Henkel 3351* (CAY, U, US). SURINAME: Boven-Sipaliwini, 2 May 1952, *D.G. Geyskes s.n.* (U); Palaime-savanne, Boven-Sipaliwini, 2 May 1952, *D.C. Geyskes s.n.* (U).

31. Rhynchospora exaltata Kunth, Enum. Pl. 2: 291. 1837. *Dichromena exaltata* (Kunth) J. F. Macbr., Field Mus. Nat. Hist., Bot. Ser. 8: 113. 1930. TYPE: Brazil; "Brasilia meridionalis," *Sellow 1216* (holotype: B, destroyed, photo US ex B; isotype: K). Figs. 22, 70A-B.

Echinoschoenus beyrichii Nees in Martius, Fl. Bras. 2(1): 132. 1842. *Rhynchospora beyrichii* (Nees) Steud., Syn. Pl. Glumac. 2: 144. 1855. TYPE: Brazil; "In silvis umbrosis humidis prope Novum Friburgum..." *Beyrich s.n.* (holotype: M).

Mitrospora cephalophora Nees in Martius, Fl. Bras. 2(1): 133. 1842. *Rhynchospora cephalophora* (Nees) Steud., Syn. Pl. Glumac. 2: 146. 1855. *Rhynchospora exaltata* var. *cephalophora* (Nees) Kük., Bot. Jahrb. Syst. 74: 440. 1949. SYNTYPES: Brazil, "In Brasilia meridionalis" *Sellow s.n.* (B); Aad Itambé et Fanado prov. Minarum, *Pohl 3569, 5064* (W).

Rhynchospora arundinacea Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 41/42: 27. 1879/1880 [1880]. TYPE: Brazil; Rio de Janeiro, *Glaziou s.n.* (holotype: B, destroyed).

Rhynchospora exaltata var. *ovalis* Kük., Bot. Jahrb. Syst. 74: 440. 1949. TYPE: Bolivia; Mapiri Region, Copacabana, 900 m, *Buchtien 339* (holotype: B, destroyed).

Rhynchospora exaltata var. *microcephala* Kük., Bot. Jahrb. Syst. 74: 440. 1949. SYNTYPE: Guyana, *Schomburgk 809* (L).

Rhizomatous perennial, 70-130 cm tall; rhizome thick, scaly, horizontally creeping, 4-10 mm thick, producing culms at 1-2 cm intervals; roots coarse, 1-1.5 mm thick; sheathing base of culm bulbous-thickened, ligneous, 6-15 mm thick. Culms erect to stiffly ascending, stout, 2-6.2 mm wide, obtusely trigonous to obtusely triquetrous distally, stiff and hardened, finely and shallowly ribbed, green to pale green, short pilose (at least at the nodes proximally) to glabrous. Leaves 13-30, ascending to spreading, primarily cauline, basal leaves reduced to bladeless sheaths or with very short blades, polyphyllus above base with short, overlapping sheaths, 5-45 cm long; sheaths eligulate, herbaceous, finely veined, green to pale brown, short pilose to glabrous, often ciliate-scabrous along junction of inner band and margin of abaxial portion of sheath, inner band on proximal sheaths membranous, brownish translucent, that on distal sheaths thinly herbaceous, the orifice concave to U-shaped; blades linear, flattened to subplicate, 3-12 mm wide, herbaceous to thickly herbaceous proximally, substiffened, finely veined, semi-glossy adaxially, short pilose along medial

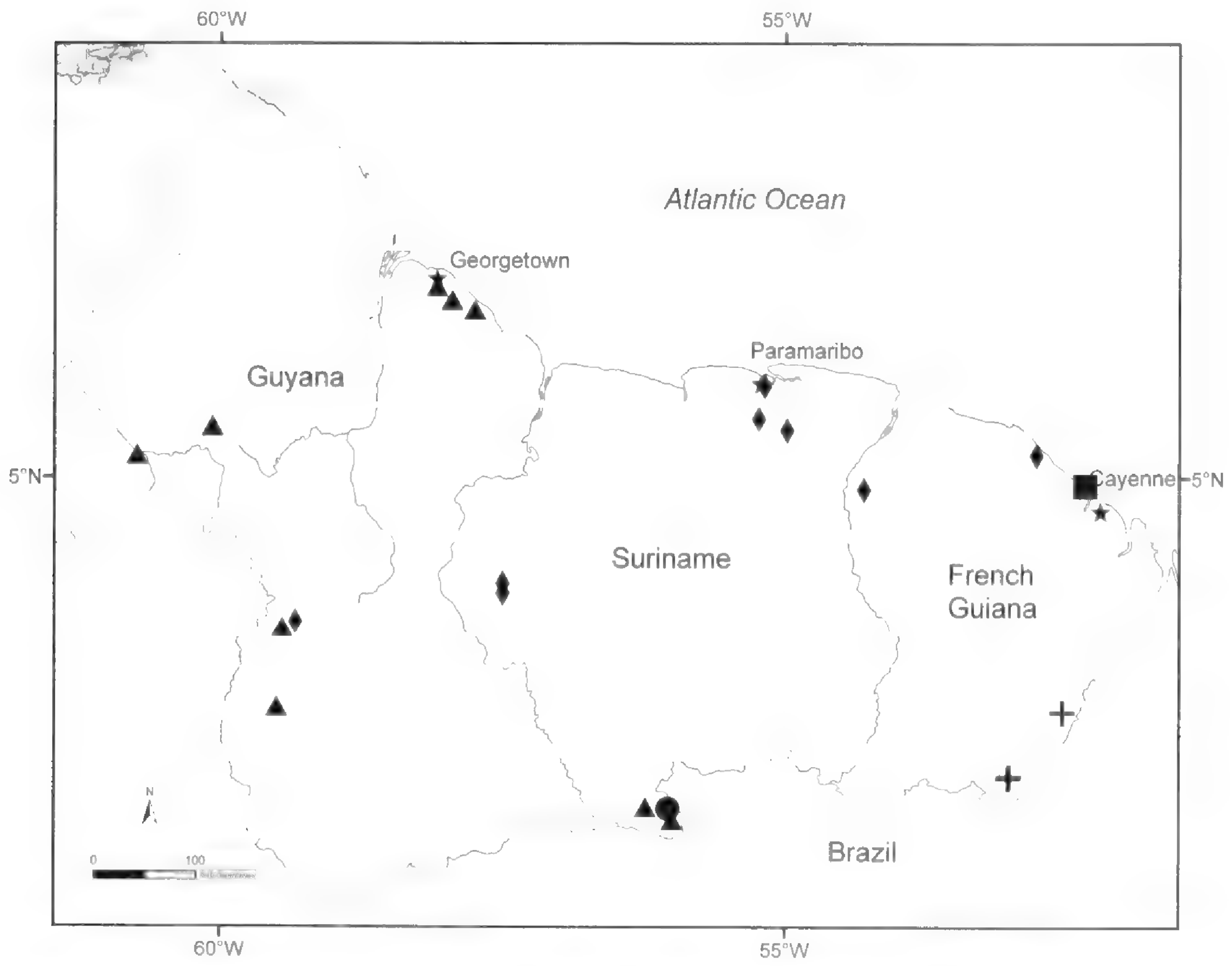

Fig. 21. Distribution of ■*Rhynchospora contracta* and *R. cordatachenia*; ✚*R. dentimux*; ♦*R. divaricata*; ●*R. donselaarii*; and ▲*R. emaciata* in the Guianas.

vein and hirsute distally adaxially on veins, green, essentially glabrous, often with remote trichomes along veins abaxially, margins and abaxial midvein ciliate-scabrous, attenuate to triquetrous apex. Inflorescence a series of (1) 2-7 remote, short peduncled, globose or 2- to 3-lobate, congested heads of spikelets from the upper leaf-like bracts, the heads 0.8-1.6 × 1.5-2 cm; peduncles trigonous, 0.6-1.5 mm wide; bracts gradually reduced upwards, often pilose adaxially proximally, uppermost heads often subtended by 3-5 narrowly linear involucral bracts at base in addition to the sheathing bract, the lowermost to 2 cm long; spikelets many, densely aggregated in heads, lanceoloid-ellipsoid, 5-7 × 0.7-1.5 mm, short cuneate at base, acuminate at apex; scales 8-10 per spikelet, dorsally rounded to widely rounded, thickly herbaceous to herbaceous, terminal scales of spikelet submembranous, finely striate, glossy, pale brown with reddish brown lineations, glabrous except for setose trichomes at apex, margins ciliate (at least distally), midcosta narrow, pale green, prominent distally, extended as a short, scabrous (glabrous on distal scales of spikelet) awn, the apex obtuse or subrounded on proximal scales, acute to acuminate on distal scales; fertile scales 3, elliptic-lanceolate to linear-lanceolate (terminal scales), 3.4-5.5 × 0.5-2 mm; sterile scales 5-7, ovate to widely ovate or ovate-elliptic, 1-3.5 × 1.2-1.8 mm. Stamens 3, the anthers 2-3 mm long, truncate and minutely lobed at base, rounded at apex, apiculus not evident; style shortly 2-branched at apex. Achenes biconvex, obovate, 2-2.5 × 1.4-1.7 mm, short-cuneate at base, obtuse at apex, shallowly transversely rugulose with longitudinal wrinkle-lines and a thickened marginal rim, glossy, yellowish brown with pale stramineous rim at apex; epidermal cells rectangular, vertically oriented; style base elongate, linear lanceolate or somewhate triangular-subulate, often slightly curvate, thickened, 1.5-1.8 × 0.3-0.5 mm, brittle, crustose, pale grayish brown; bristles absent.

Distribution: Central America (Honduras), Greater Antilles (Cuba and Hispaniola), and South America (Venezuela, Guyana, Brazil, Bolivia, and Paraguay).

Habitat in the Guianas: Upland habitats, frequently on lateritic soils; grassy hillsides, rolling savanna, scrub forest, rock overhangs, ridges, and cliff edges, 550-1250 m.

Specimens examined: GUYANA: Roraima, 1863-1864, *C.F. Appun 1179* (K); Hill between rivers Ireng and Tumung [Iwaipai Mt.], ca. 2000 ft, 2 Aug 1958, *S.G. Harrison 1419* (BRG, K); Kurikabaru, 4/1/1960, *S.A. Harris K19* (K); Pakaraima Mts, Mountain N of Chinoweing Village, 05°32'N, 60°07'W, 650-750 m, 22 Feb 1987, *J.J. Pipoly et al. 10511* (B, MO, NY, US); Upper Ireng River, Cipo settlement, 2 km W to Ireng River, 04°49'N, 60°02'W, 550-585 m, 15 Jan 1993, *T.W. Henkel et al. 785* (CAY, NY, US); Pakaraima Mountains, south rim, summit ridge, Cipo Mountain, ± 2-4 km from headwaters of Cipo Creek, 04°54'N, 60°05'W, 1250 m, 28 Jan 1993, *T.W. Henkel et al. 1070* (NY, US); Pakaraima Mountains, Cipo Mountain; sheetrock area N and NW of summit ridge, 04°54'N, 60°05'W, 1250 m, 30 Jan 1993, *T.W. Henkel et al. 1123* (US); Northern Pakaraimas, Kato Village, 04°39'48"N, 59°48'33"W, 834 m, 5 Jun 1995, *P. Mutchnick 1534* (US); Makarapan Mountain, southern false summit, 03°57'55"N, 58°51'58"W, 870 m, 29 Sep 1997, *H.D. Clarke et al. 6887* (US); Acarai Mountains, ridge ascending to summit of unnamed peak, 6 km S of Sipu River, 01°22'24"N, 58°56'52"W, 700 m, 26 Aug 1998, *H.D. Clarke et al. 7152* (US).

32. Rhynchospora fallax Uittien, Recueil Trav. Bot. Néerl. 22: 336. 1925. *Rhynchospora setacea* var. *fallax* (Uittien) Kük., Bot. Jahrb. Syst. 75 (3): 290. 1951. *Rhynchospora tenerrima* subsp. *fallax* (Uittien) T. Koyama, Mem. New York Bot. Gard. 23: 70. 1972. TYPE: Suriname, *Pulle 270* (holotype: U!; isotypes: P, US!). Figs. 22, 82A-B.

Caespitose annual, 4.5-25 cm tall; roots fine to medium. Culms ascending, 0.3-0.8 mm wide, obtusely trigonous to compressed-trigonous, often channeled along one side distally, soft, flexuous, finely ribbed, minutely punctate, pale green, glabrous. Leaves numerous, short, ascending, primarily basal, 1-3 cauline, 6.5-32 cm long; sheaths eligulate, slightly inflated, herbaceous, finely veined, pale green, glabrous, inner band membranous on basal sheaths, herbaceous on cauline leaves except for membranous orifice, the orifice truncate to concave; blades linear-filiform to capillary, tightly involute to capillary-channeled distally, folded or involute proximally, 0.6-2.2 mm wide, herbaceous, finely veined, minutely punctate, glabrous, margins essentially smooth to antrorsely scabrous distally, the apex long-acuminate,

flattened. Inflorescence a terminal and a series of 2 or 3 lateral, relatively open, small corymbose partial panicles from the upper leaf-like bracts; bracts to 10 cm long; terminal panicle 1.5-3 cm long, 0.6-2.3 mm wide with (2-) 3-20 spikelets; branches to 2 cm long, obtusely trigonous, subterete or crescentiform-capillary; spikelets narrowly ovoid-ellipsoid to ellipsoid-lanceoloid, 4.5-6 (-6.3) × 1-1.8 mm, acuminate at apex, short-cuneate at base, scales spreading with maturing achenes; scales 6-8 per spikelet, dorsally acute to obtuse or subrounded, herbaceous, sterile scales at base of spikelet subcoriaceous, smooth, glabrous, uniformly light brown, often tinged with brown or dark brown, reddish lineations indistinct or faint, glabrous, margins broadly scarious, midcosta fine, pale, indistinct proximally, extending beyond acute to acuminate apex as a short 0.5-1 mm long antrorsely scabrous awn; fertile scales 4 or 5, ovate-elliptic to ovate-lanceolate, (3-) 3.3-4.7 (-5) × 1.5-3.2 mm; sterile scales 2 or 3, ovate to ovate-elliptic, 1.4-2.7 × 0.7-1.5 mm. Stamens 2, the anthers 1.3-2.3 mm long, apiculate at apex, truncate and papillate at base; style distinctly 2-branched, the branches $^2/_3$ to equaling length of unbranced portion. Achene biconvex, obovate, 1.3-1.7 (-2) × 1-1.5 mm, transversely rugose, pale brown to brown, reddish brown, red, or brownish black, sometimes with a gray longitudinal stripe medially on both sides, truncate at apex with a spreading often slightly undulate rim, abruptly narrowing at base to a whitish translucent, cellular-reticulate stipe, narrowly cellular-reticulate on margins, essentially transversely rugose from margin to margin; epidermal cells linear, vertically oriented; style base depressed-trigonous, buttressed, in shallow depression rimmed by apex of achene, 0.2-0.6 × 0.5-0.7 mm, soft, brittle, brown; bristles absent.

Distribution: Northern South America (Colombia, Venezuela, Suriname, French Guiana, and Brazil) and western Africa.

Habitat in the Guianas: Often on granitic substrates; granite flats, boulder fields, outcrops, and granite inselbergs in "savane roche" (rock savanna) communities, 130-500 m.

Discussion: This species was treated as a subspecies of *Rhynchospora tenerrima* Nees ex Sprengel by Koyama (1972). However, I feel that there is justification for keeping these two taxa separate based on a number of consistent character differences between them. *Rhynchospora fallax* has inflorescence partial panicles that are more open with branches up to 2 cm long; the spikelet scales, particularly the lower fertile and sterile basal ones, are only faintly lineolate; and the achene is truncate at apex with a spreading, undulate rim that is not confluent with style base and has margins that are very narrowly cellular-reticulate, the surface essentially transversely rugose from margin to margin. *Rhynchospora tenerrima* has inflorescences that are contracted, the panicle branches short, to 5 mm long; the spikelet scales are distinctly reddish brown lineolate; and the achene apex is prolonged on either side as an ear- or horn-like projection, with the edges of the tounge-like, dilated style base decurrent along its edges and has margins that are widely cellular-reticulate papillate with only the medial area of achene transversely rugose. Also, there are differences in habitat. *Rhynchospora fallax* is restricted to granitic substrates such as granite flats, boulder fields, outcrops, and inselbergs while *R. tenerrima* is a more widespread species occurring in savanna, swampy areas, creek beds, lowland wet forest, palm swamps, trails, roadsides, and disturbed areas.

Specimens examined: FRENCH GUIANA: Massif des Emerillons, centre sud, 240 m, 10 Sep 1980, *G. Cremers 6618* (NY); Monts Bakra "savane roche" sur affleurements granitiques à 1.5 km à l'Ouest du Pic Coudreau, 2 Oct 1980, *J.J. de Granville 4093* (P); Akouba Booka goo Soula, Camp #3, Roche no. 1, bassin du Haut-Marouini, 160 m, 28 Aug 1987, *J.J. de Granville et al. 9814* (US-mixed collection); Monpé Soula, Roche no. 3, Camp #4, bassin du Haut-Marouini, 5 km W, 200 m, 01 Sep 1987, *J.J. de Granville et al. 9917* (CAY, P, US); Montagne des Nouragues, Bassin de l'Arataye, sommet, 411 m, 04°03'N, 52°42'W, 24 Mar 1988, *C. Sarthou 249* (CAY, NY); Montagne des Nouragues, Bassin de l'Arataye, sommet, 411 m, 04°03'N, 52°42'W, 24 Mar 1988, *C. Sarthou 242* (CAY, NY); Roche Touatou, Bassin de l'Oyapock, versant sud du Mont Touatou, 130 m, 18 May 1995, *G. Cremers & J.J. de Granville 13984* (CAY, NY, P, US); Roche Touatou, Bassin de l'Oyapock, 02°57'N, 52°32'W, 200 m, 18 May 1995, *J.J. de Granville & G. Cremers 12957* (CAY, GENT,P, U, US); Monts d'Arawa, zone de la savane-roche centrale, 02°49'N, 53°22'W, 220 m, 04 Jul 2002, *J.J. de Granville et al. 15014* (CAY, NY, P, US). SURINAME: Upper Coppename Rivier, near Voltz Berg on granite flat, 23 Aug 1920, *A.A.*

Pulle 270 (K, P, U, US); Wilhelmina Gebergte, 01 Aug 1926, *B.W. Boschwezen 7117a* (U); nabij k, "14", tussen Lucie Rivier en Wilhelmina Gebergte, ca. 275 m, 6 Aug 1963, *J.P. Schulz 10345* (U); granietplaat Eilerts de Haan Gebergte, 4 km v. Zuid Rivier, 14 Aug 1963, *J.P. Schulz 10410* (U); eil.in stroomversn.Zuid Rivier, bij samenvl, met Lucie Rivier, 5 Jul 1963, *J.P. Schulz & J.P. Wessels Boer 10046* (U); granietplaat nabij kamp "km 9", lijn Luci Rivier, Wilhelmina Gebergte, ca. 300 m, 16 Jul 1963, *J.P. Schulz 10087* (U); granietplaat nabij kamp "km 9", lijn Luci Rivier, Wilhelmina Gebergte. ca. 300 m, 19 Jul 1963, *J.P. Schulz 10136* (U); Zuid Rivier, 2 km above affluence with Lucie Rivier, Wilhelmina Gebergte, 220 m, 5 Jul 1963, *B. Maguire et al. 54033* (US); Lucie Rivier, 9 km N of and 12 km W of Oost Rivier, Wilhelmina Gebergte, 275 m, 16 Jul 1963, *B. Maguire et al. 54225* (US);1 km NW van Voltz Berg, Coppename Rivier, 7 Feb 1965, *J.P. Schulz & J. van Donselaar 10554* (U); Sipaliwini Savanne, granite flat near Morro Grande, 1 Nov 1968, *F.H.F. Oldenburger & R. Norde 982* (U); Voltz Berg, N.W. plaat, 15 Oct 1971, *J.P. Schulz 13008* (U); Tumuc Humac Mountains, Talouakem, 02°31'N, 54°45'W, 500 m, 13 Aug 1993, *P. Acevedo-Rdgz. et al. 6016* (US).

33. Rhynchospora fascicularis (Michx.) Vahl, Enum. Pl. 2: 234. 1806. *Schoenus fascicularis* Michx., Fl. Bor.-Amer. 1: 37. 1803. TYPE: United States; "Hab. in Carolina," *Bosc s.n.* (holotype: P; isotype: fragment NY; photo: GH). Figs. 22, 68A-B

Caespitose perennial, 30-95 cm tall; rhizome short; roots medium-sized; sheathing base of culm 1.2-4 mm wide. Culms ascending, 0.6-1.7 (-2) mm wide, obtusely 3-angled to terete distally, firm, not easily compressed, finely ribbed, green, glabrous. Leaves 4-11, ascending, basal and 3-5 cauline, 6-30 cm long; sheaths short, eligulate, herbaceous, finely veined, pale brown to brown, glabrous, inner band membranous on basal sheaths, copiously red-dotted, splitting with age, herbaceous on upper sheaths with only the orifice membranous, the orifice convex to truncate; blades narrowly linear, 1-3 mm wide, V-shaped or involute, herbaceous, finely veined, green to pale, glabrous, margins essentially smooth, but sometimes remotely and bluntly scabrous, the apex filiform, long-acuminate to antrorsely scabrous apex. Inflorescence a simple fascicle or corymbosely compound group of 3-5 fascicles with often 1 or 2 lateral smaller fascicles below from the upper leaf-like bracts, the lowermost bract equaling to exceeding the inflorescence fascicles; fascicles hemispherical, 5-10 × 5-15 mm; spikelets 8-40 per fascicle, ovate-elliptic or elliptic, acute to short-acuminate at apex, short-cuneate at base, 3-4 × 1-1.8 mm, the spikelet scales spreading with maturing achenes; scales 5 or 6 per spikelet, herbaceous to submembranous, dorsally rounded, reddish brown, glabrous, margins narrowly to broadly scarious, erose, acute at apex, midcosta distinct, very narrow, brown to pale brown, the sides often with fine blackish striations running longitudinally and curving out to the margins; fertile scales 3 or 4, ovate, 2-3 × 1.3-2.8 mm, often inrolled around flowers; sterile scales 2, ovate, 1.3-2.1 × 0.7-1.3 mm. Stamens 3, sometimes 1 or 2 abortive (terminal flower of spikelet often staminate only with 1 stamen and abortive pistil), the anthers 1-1.5 mm long, apiculate at apex, truncate and minutely papillate at base; style 2-branched, the stigmas equaling to slightly exceeding length of unbranched portion of style. Achene biconvex, obovate, 1.3-2 × 1.1-1.5 mm, indistinctly transversely rugulose to smooth, dark brown to blackish with a yellowish brown to deep red circular patch medially, acute to abruptly acuminate to base, truncate at apex; epidermal cells isodiametric, no central nodules evident; style base triangular, 0.5-1 mm long, 0.7-1 mm wide at base, brown, the margins smooth to sometimes scabridulous; bristles 6, filiform, exceeding the achene body, shorter than to equaling tip of style base, reddish, antrorsely barbed, often with trichomes at base.

Distribution: Southeastern United States, Mexico, Central America (Honduras, Nicaragua), Greater Antilles (Cuba), and northern South America (Guyana and Suriname).

Habitat in the Guianas: Sandy soils of wet savanna, ditches, and marshy areas.

Discussion: The achenes of the Suriname material have bristles as long as or exceed the achene body typical of plants referred to *Rhynchospora distans* (Michx.) Vahl (*R. fascicularis* var. *distans* (Michx.) Chapman). However, because the morphology of the achene body is identical to typical *R. fascicularis*, and together with material I have studied from the West Indies in which short bristle achene forms and long bristle achene forms occur in the same inflorescence, the Surinam material is here treated

as typical *R. fascicularis*.

Specimens examined: GUYANA: Annandale, Essequibo, 19 Jun 1960, *S.A. Harris TP442* (K). SURINAME: Without locality, 1846?, *F.W.R. Hostmann 275a* (MO, P-4); Zanderij I, airfield, Oct 1941, *G. Stahel 145* (U) Zanderij, 19 Dec 1950, *J. Florschütz & P.A. Florschütz 631* (C, U); along Cordon-path between Kopi and Jodensavanne, 17 Jul 1953, *J.C. Lindeman 4345* (U); Lobin-savanna inter Zanderij I and Hannover, opn. 122, 8 Oct 1958, *J. van Donselaar & W.A.E. van Donselaar 157* (U); near Zanderij, Feb 1976, *R. Jansma 3* (U).

34. Rhynchospora filiformis Vahl, Enum. Pl. 2: 232. 1805. *Dichromena filiformis* (Vahl) Kunth, Enum. Pl. 2: 281. 1837; *Spermodon filiformis* (Vahl) Nees in Martius, Fl. Bras. 2(1): 118. 1842. TYPE: Puerto Rico, *Ledru s.n.* (holotype: C-Vahl; isotype: P!). Figs. 23, 80C-D.

Rhynchospora podosperma C. Wright in Sauvalle, Anales Acad. Ci. Méd. Habana 8: 87. 1871. TYPE: Cuba; A Pinar del Rio y Coloma, *Wright 3791* (holotype: GH; isotype: NY!, P, US!).

Rhynchospora longispicata Boeck., Linnaea 37: 600. 1873. LECTOTYPE: French Guiana. *Sagot 1389* (cited as *Sagot 389*) (BM!; isolectotype: K!), designated by M. T. Strong & P. Acevedo-Rodríguez, Contr. U. S. Natl. Herb. 52: 347. 2005.

Rhizomatous perennial, 13-50 cm tall, culms sprouting in close clusters at nodes of rhizome; rhizome short, knotty; roots fine to medium, to 1 mm thick. Culms ascending, bulbous and horizontal at very base, abruptly arched-ascending, 0.6-1.3 mm wide, to 1.7 mm wide at base, trigonous to obtusely trigonous, firm but flexuous, essentially smooth, often channeled along one side distally, green, glabrous. Leaves 3-7, ascending, primarily basal, 1 or 2 lower cauline or sometimes one to about the middle, 3-40 cm long; sheaths ligulate with a very narrow thickened band of tissue at the adaxial junction of sheath and blade, soft, finely veined, green, glabrous, inner band membranous, finely cellular-reticulate, the orifice entire, convex to truncate; blades linear-filiform, thickened, 0.3-3 mm wide (unfolded), V-shaped to somewhat crescentiform-capillary or trigonous, triangular-channeled distally, often folded proximally, firm but flexuous, finely veined abaxially, green, glabrous, smooth, shining, and cellular-reticulate adaxially, margins generally smooth proximally, antrorsely scabrous distally, the apex attenuate to tip. Inflorescence a terminal and series of 1-4 lateral, lax, corymbose partial panicles from the upper leaf-like bracts, the lowermost long-peduncled; bracts as long as to twice exceeding length of subtending panicle; terminal panicle 1.5-5 × 0.6-4.5 cm, with (1-) 2-20 (-30) spikelets, rarely reduced to a single spikelet; branches crescentiform-capillary to compressed-trigonous or subterete, finely ribbed, glabrous; spikelets linear, ellipsoid-lanceoloid, (8-) 9-13 (-14) × 1-1.8 mm, the fertile scales spreading with maturing achenes; scales 6-13 per spikelet, variable in cross section, fertile scales dorsally rounded and inrolled around developing pistil, sterile scales dorsally acute to obtuse, lower fertile and sterile scales subcoriaceous, smooth and semi-glossy, glabrous, brown medially, light brown on sides with brown lineations, margins scarious, midcosta pale brown to greenish brown, indistinct, very narrow, prolonged beyond the acute to acuminate apex as an antrorsely scabrous awn, upper fertile scales hidden, thin and membranous, linear-lanceolate; fertile scales 3-9, ovate-lanceolate to linear-lanceolate, 5.3-11.5 × 0.8-2.8 mm; sterile scales 3 or 4, ovate-elliptic, 1.7-3.7 × 0.7-2 mm. Stamens 3, the anthers 2.5-4 mm long, apiculate at apex, truncate at base with crystalline papillae; style deeply 2-branched, the branches about same length as unbranched portion, well exserted beyond apex of subtending scale. Achene biconvex, obovate to oblong-obovate, 1.5-2.2 mm long (including stipitate base), 1.1-1.3 mm wide, truncate to concave at apex, narrowed below to a tounge-like, finely cellular-reticulate stipitate base, relatively smooth or distinctly to faintly cellular-reticulate medially, light brown to brown with a longitudinal gray stripe medially on each side, margins often prolonged at apex on either side as a short tooth, cellular-reticulate-papillose, the epidermal cells bulging at maturity forming a pebbly surface; epidermal cells rectangular and vertically oriented medially, often isodiametric towards margins; style base triangular, 0.3-0.5 × 0.3-0.7 mm, rimmed by the truncate to concave apex of achene, brittle, brownish black; bristles absent.

Distribution: Mexico, Central America (Guatemala, Honduras, Nicaragua, and Costa Rica), Greater Antilles (Cuba, Hispaniola, and Puerto Rico), Trinidad, and South America (Venezuela, Guyana, Suriname, French Guiana,

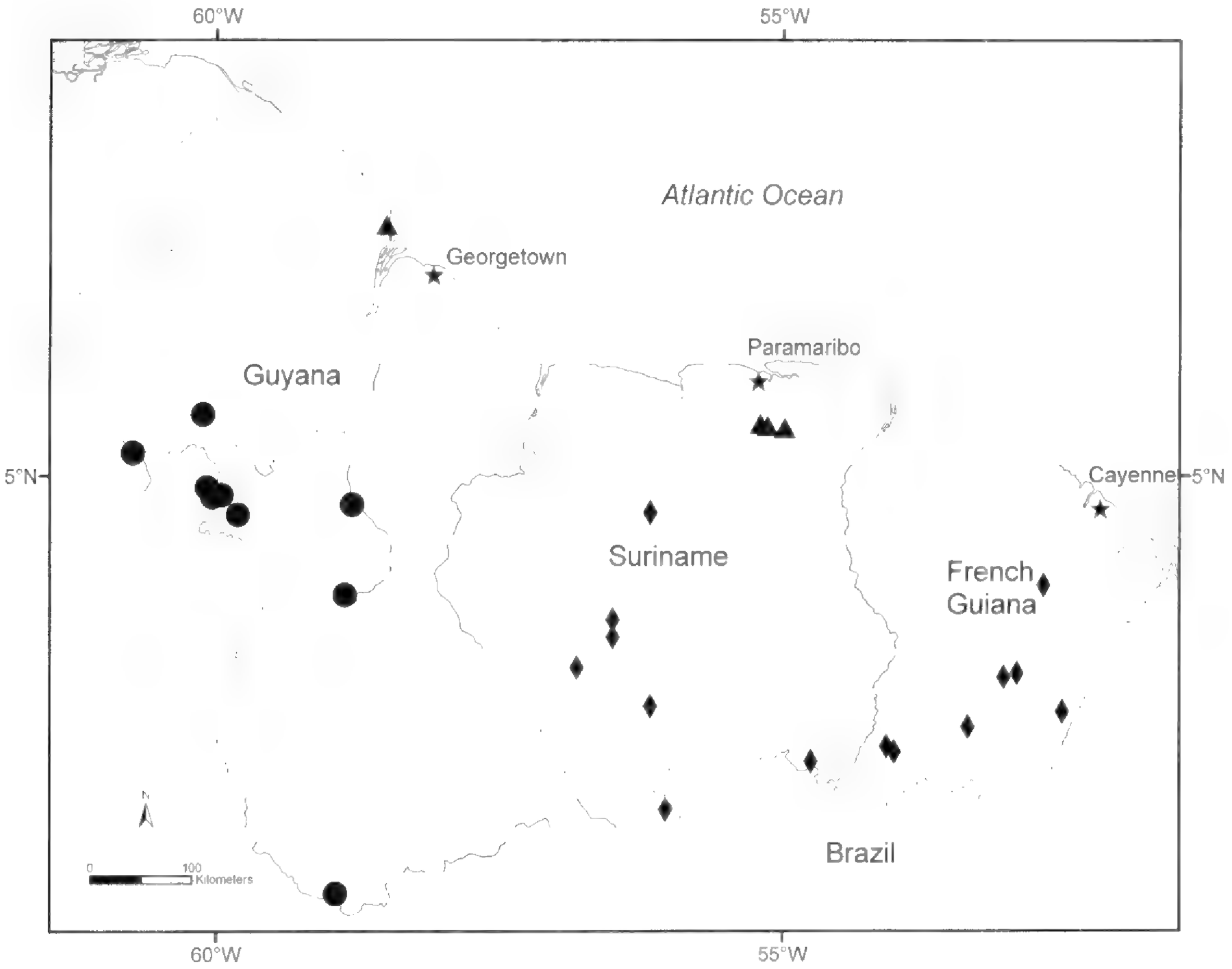

Fig. 22. Distribution of ●*Rhynchospora exaltata*; ♦*R. fallax*; and ▲*R. fascicularis* in the Guianas.

and Brazil).

Habitat in the Guianas: Wet lowland to upland white-sand savanna or sandy areas in clay savanna; seepages, grassy swales, and seasonal pond margins, 0-1050 m.

Specimens examined: FRENCH GUIANA: Cayenne, without date, *M. Poiteau s.n.* (B); Savane de Sinnamary. Exploitation maraîcherè de Benoît GIRARD, without date, *A. Leclerc 145* (CAY); Without locality,1840, *M. Leprieur s.n.* (C); Cayenne, 1859!, *P. Sagot 1389* (BM, K, P); Cayenne, 1867, *H. Jelski s.n.* (US); Campo de Passoura, Perene, 21 Oct 1954, *G.A. Black & Klein 17081* (US); Campo de Passoura, 25 Oct 1954, *G.A. Black & Klein 54-17223* (NY, US); Route de Cabassou, Lomane Calumbe, 31 Aug 1955, *J.J. Hoock s.n.* (NY, U); Région de Cayenne, route Cayenne-le Gallion, à 1 km à l'est du camp militaire du Gallion, Jan 1974, *B. Descoings & Cl. Luu 20236* (CAY); Savane du Gallion, 20 km SSE of Cayenne, 4 Mar 1976, *A. Raynal-Roques & C. Tirel 18431* (P, U, US); Savane Matiti, 32 km WNW du bac de Macouria, W de Cayenne, 18 Mar 1976, *A. Raynal-Roques 18716* (P, U); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 10 Mar 1977, *G. Cremers & Y. Veyret 4430* (CAY, FTG, NY, P-2); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 10 Mar 1977, *G. Cremers & Y. Veyret 4437* (CAY, FTG, NY, P); Savane de Corossony, sur la piste de St. Elie, 4 à 7 km à l'WSW de Sinnamary, 22 Dec 1977, *A. Raynal-Roques 19685* (CAY, P-2); Marais à env., 2.5 km à l'E de Roura (25 km S de Cayenne), 25 Feb 1978, *A. Raynal-Roques 20118* (CAY, P-2); Dépression dans le domaine de Magnan, le long de la Comté, Sud est de Cayenne, Aug 1982, *Merlier GY48* (CAY); ca. 15 km S of Cayenne on N2 Hwy, 04°48'N, 52°23'W, 2 Jul 1988, *R.M. Harley 24799* (CAY, K); Savane Macrabo, Région de Cayenne, 20 m, 8 Dec 1988, *M. Hoff 5448* (B, CAY, G, MO, NY, P, U, US); Savane Macoua, Région littorale, Le long d'une piste allant de la R.N.1. vers la mer, 10 m,

05°29'N, 53°53'W, 26 May 1989, *M. Hoff & G. Cremers 5690* (CAY, NY); Dégrad Saramaca, Bassin du Kourou, SSW Kourou, 20 m, 9 Jun 1989, *G. Cremers & M. Hoff 10700* (CAY, NY, US); Grand Pripris de Yiyi, Région littorale, 2 m, 05°26'N, 53°05'W, 4 Jun 1992, *D. Toriola-Marbot & M. Hoff 193* (CAY); Savane Nicole, 05°15'10"N, 52°46'41"W, 23 Mar 1995, *L. Cadamuro & Solacroup 495* (CAY); Savane incluse "Agami", 05°15'28"N, 52°48'37"W, 8 Mar 1995, *L. Cadamuro & Solacroup 394* (CAY); Savane Malmanoury 2, 05°17'24"N, 52°48'42"W, 14 Feb 1995, L. Cadamuro & Solacroup 254 (CAY); Savane Dégonde, 05°18'26"N, 52°50'40"W, 5 Feb 1995, *L. Cadamuro & Solacroup 139* (CAY); Savane Diane 1, 05°14'48"N, 52°48'33"W, 2 Feb 1995, *L. Cadamuro & Solacroup 57* (CAY); Savane Karouabo 2, 05°14'42"N, 52°47'09"W, 1 Feb 1995, *L. Cadamuro & Solacroup 32* (CAY); Savane Renner, Région littorale, 3 m, 05°20'N, 52°53'W, 18 Apr 1996, *G. Cremers & J.J. de Granville 14394* (CAY, NY). GUYANA: British Guiana, without date, *R. Schomburgk 540* (P); Roraima, Mar 1842, *R. Schomburgk 540*a (BM); Lama, 06°33'N, 57°57'W, Oct 1888, *G.S. Jenman 4533* (BRG, K, MO, NY, U, US); Without locality, Nov 1905, *A.W. Bartlett 8177* (BRG, K); Rupununi, 1934!, *Herbarium 69* (K); Sand Creek, Rupununi River, Sep 1948, *Forestry Division Guyana WB162* (NY); Sand Creek, Rupununi River, Sep 1948, *Fr. G. Wilson-Browne s.n.* (K); St. Ignatius, Rupununi, 12 Jul 1958, *S.G. Harrison 1270* (BRG, K); Rupununi savanna, near Kanuku Mountains, 14 Feb 1959, *J. Lanjouw et al. 745, 746a* (U); Rupununi savanna, near Kanuku Mountains, 16 Feb 1959, *J. Lanjouw et al. 811* (U); 0.5 mi S of St. Ignatius,12 Aug 1963, *R.J.A. Goodland & P.F. Maycock 368* (NY); Mountain View, Nappi, 10 Sep 1963, *R.J.A. Goodland & R. Persaud 632* (NY); Rupununi savanna, Feb 1974, *A. Cooper 380* (U); Rupununi District, Manari, 20 Oct 1979, *P.J.M. Maas et al. 3687* (K, NY, U); Rupununi District, Manari, 22 Oct 1979, *P.J.M. Maas et al. 3740* (F, K, MO, NY, P, U); vicinity of Karanambo, 26 Sep 1988, *P.J.M. Maas et al. 7697* (NY, U, US); Rupununi savanna, Towatawan Mountain, 11 km E of Dadanawa, 02°49'30"N, 59°25'W, 150 m, 3 Jul 1989, *L.J. Gillespie 1991a* (US); Gunn's, Essequibo River, 240-260 m, 5 Sep 1989, *M.J. Jansen-Jacobs et al. 1479* (MO, NY, P, U, US); SE Kanuku Mountains, 03°04'N, 59°25'W, 250-350 m, 25 Jun 1989, *L.J. Gillespie et al. 1868* (US); Pakaraima Mountains, Mt. Kukuinang, Kukuinang savanna, 2-3 km SSW from mountain peak, 05°04'N, 59°57'W, 950-1050 m, 27 Feb 1993, *T.W. Henkel et al. 1637* (US); South Rupununi savanna, Aishalton village, 02°31'N, 59°20'W, 200 m, 3 Aug 1994, *T.W. Henkel & R. James 3983a* (US); South Rupununi savanna, Aishalton village, 200 m, 3 Aug 1994, *T.W. Henkel & R. James 3983* (US); Rupununi Northern Savanna, just west of large airstrip NW of Karanambo, 03°50'N, 59°10'W, 80 m, 22 Oct 1996, *C.N. Horn & J. Wiersema 11078* (US); Rupununi Northern Savanna, Pirara head waters, NW of Yupukari, 03°40'N, 59°30'W, 80 m, 22 Oct 1996, *C.N. Horn & J. Wiersema 11047* (US). SURINAME: Railway near km 106 [between km 72 and Kabelstation], 22 Apr 1949, *J. Lanjouw & J.C. Lindeman 3028* (U); along railway at km 114.5 [between km 72 and Kabelstation], 23 Apr 1949, *J. Lanjouw & J.C. Lindeman 3059* (U); Kasiwinika (Cassewinica) Kreek, near Kopie, 15 Jul 1953, *J.C. Lindeman 4285* (F, U); between Zanderij and Matta, 26 Aug 1954, *J.C. Lindeman 6526* (U, US); near Vier Kinderen, 31 May 1956, *P.C. Heyligers 89* (U); Langs spoorbaan op savanna sand, 19 Mar 1956, *Ir J.G.P. Dirven LP591* (U); Langs spoorbaan bij km 101 op wit zand, 19 Mar 1956, *Ir J.G.P. Dirven LP588* (U); Lobin-savanna inter Zanderij I and Hannover, Aug 1958, *J. van Donselaar & W.A.E. van Donselaar 401* (U); Digi Ollo Savanne, vlak ten N van Hanover, 30 Oct 1958, *J. van Donselaar et al.193* (U); Lobin-savanna inter Zanderij I and Hannover, 9 May 1959, *W.A.E van Donselaar DC16* (U); Gros Savanne (prope km 103), bij opname 316 m, 9 Apr 1959, *J. van Donselaar 713* (U); Brownsweg ad viam ferream prope km 115-116, Patrick savanna, 7 Apr 1961, *J. van Donselaar 3231* (NY); Kayserberg-airstrip on the Zuidrivier, 03°12'N, 56°30'W, 22 Feb 1961, *K.U. Kramer & W.H.A. Hekking 2999* (C, K, NY, U); Kayser Gebergte Airstrip, south central Suriname, 45 km above confluence with Lucie Rivier, 2 Dec 1961, *R. Freund & S.Freund 10b* (US); Brownsweg, 7 Apr 1961, *K.U. Kramer & W.H.A. Hekking 3231* (U); 2 km N of Lucie Rivier, 2 km W of Oost Rivier, 225 m, 16 Jul 1963, *B. Maguire et al. 54217* (NY); Lucie Rivier, Wilhelmina Gebergte, ca. 2 km van Lucie Rivier, 9 Aug 1963, *J.P. Schulz 10353* (U); Zuid Rivier, S of Kayser airstrip, 45 km above confluence with Lucie Rivier, 270 m, 22 Sep 1963, *H.S. Irwin et al. 55955* (NY, US); 2-3 km S of Saparra Kreek, Maratakka O-oever, 28 May 1965,

P.J.M. Maas & J.A. Tawjoeran 3316 (U); Upper Sipaliwini area, 02°00'N, 56°09'W, 4 Sep 1966, *J. van Donselaar 3690* (U); Sipaliwini Savanne, 17 Dec 1968, *F.H.F. Oldenburger & R. Norde 945* (U); Sipaliwini Savanne area on Brazilian frontier, 5 km S of 4-Gebroeders Mountains, 14 Oct 1968, *F.H.F. Oldenburger et al. ON273* (U); Sipaliwini Savanne, 4 Sep 1968, *F.H.F. Oldenburger & R. Norde 57* (U); Sipaliwini Savanne area on Brazilian frontier, W Sipaliwini Savanne, 4 Sep 1968, *F.H.F. Oldenburger et al. ON57* (U); Sipaliwini Savanne, 14 Oct 1968, *F.H.F. Oldenburger & R. Norde 273* (U); Zanderij Savanne, Sep 1976, *R. Jansma 35* (U); Jorka Savanne, upper Marataka Rivier, 17 Aug 1976, *R. Jansma LBB15888* (U); Tibiti Savanne, 20 May 1976, *P.A. Teunissen LBB16110* (U); Hanover, 2.5 km E of Paramaribo-airport road, 29 Sep 1979, *W.W. Thomas 2380* (NY).

35. Rhynchospora gigantea Link in Sprengel, Schrader, and Link, Jahrb. Gewächsk. 1(3): 76. 1820. TYPE: Brazil, *Hoffmannsegg s.n.* (holotype: B-Willd. no. 1129, microfiche US ex B). Figs. 24, 59A-B.

Coarse, robust perennial, 0.6-1.5 m tall; rhizome short, thick, knotty, hardened; roots coarse, 2-4 mm thick, golden brown, lustrous, spongy, easily compressed with internal chambers; sheathing base of culm stout, 1-3.5 cm wide. Culms solitary, ascending, (2-) 3-7.5 mm wide, up to 10 mm wide at swollen nodes, finely ribbed, smooth, glabrous, trigonous, channeled along one side distally, somewhat soft and often hollow proximally just below leaf nodes of cauline leaves, firm distally; Leaves 9-20, ascending, basal and cauline, (3.5-) 4-15 dm long; sheaths spongy-thickened, at least proximally, glabrous, the inner band herbaceous except for the truncate, scarious-tipped orifice, eligulate, to 20 cm long, smooth proximally, with cross partitions between veins distally; blades narrowly linear, flattened to plicate proximally, those borne from basal sheaths often spongy-thickened proximally, (5-) 9-23 (-25) mm wide, glabrous, abaxial side bright green, with distinct cross partitions between veins, adaxial side dark green, lustrous, glossy, smooth, margins and midvein beneath antrorsely scabrous, long-acuminate to triquetrous apex. Inflorescence a terminal and series of 1-4 lateral, remote to subcontiguous, large compound corymbose partial panicles from the upper leaf-like bracts, (10-) 12-50 (-60) × 5-15 cm, the spikelets congested at ray tips in globose or hemispherical clusters of 20-40, 12-16 mm in diam.; peduncles slender, flattened-trigonous to crescentiform, finely ribbed, antrorsely scabrous along margins, 1-2 mm wide; panicle branches trigonous to flattened trigonous or subcompressed, finely ribbed, smooth to antrorsely scabrous on margins; spikelets ovoid-ellipsoid, short-acuminate at apex, obtuse at base, (4.5-) 5-6 (-6.5) × (1.2-) 1.5-2.2 mm; scales 7-11 per spikelet, thin, uniformly brown, glabrous, indistinctly finely veined, the apex acute to short-acuminate; fertile scales 4-6, ovate-elliptic, the distal ones ovate-lanceolate to lanceolate, (3-) 4-6 (-6.5) × (2-) 2.2-3.1 (-3.3) mm; sterile scales 3 or 4, smaller than the fertile, ovate (excluding the 0.8-1 mm long, broadly ovate to rounded, 2-nerved prophyll with truncate or emarginate apex at base), 1.1-2.5 × 0.8-3 mm. Stamens 3, the anthers linear, 2-3 mm long, connective prolonged as a dark brown or blackened, short, lance-subulate appendage at apex, truncate with minute papillae at base; styles unlobed or shortly bi-lobed at apex, glabrous. Achene elliptic-obovate, 2-2.5 × 1-1.2 mm, papillate, transversely rugulose medially on sides, the thickened margins with constrictions and protuberances; epidermal cells rectangular, vertically oriented, no central nodules evident; style base narrowly triangular, 2-2.8 mm long, 1-1.2 mm wide at base, as wide and thick as achene at base, spongy-thickened with a narrow vertical channel medially on each side; bristles 6, exceeding the achene, shorter than to equaling tip of style base, antrorsely barbed.

Distribution: Southern Mexico, Central America (Nicaragua), Greater Antilles (Cuba and Puerto Rico), and South America (Venezuela, Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: Generally in water of swamps, swamp forests, seasonal ponds in savanna, marshes, and along canals, 0-10 m.

Distinguishing features: This species is readily distinguished from other members of *R.* section *Longirostres*, by its leaf blades which have cross partitions between the veins abaxially and are dark green and glossy adaxially, while the adaxial leaf blade surface of other species in the section are typically dull green. From the closely related *R. corymbosa*, it can also be distinguished by its spikelets which are congested in globose clusters while those of *R. corymbosa* are in hemispherical, shortly branched fascicles.

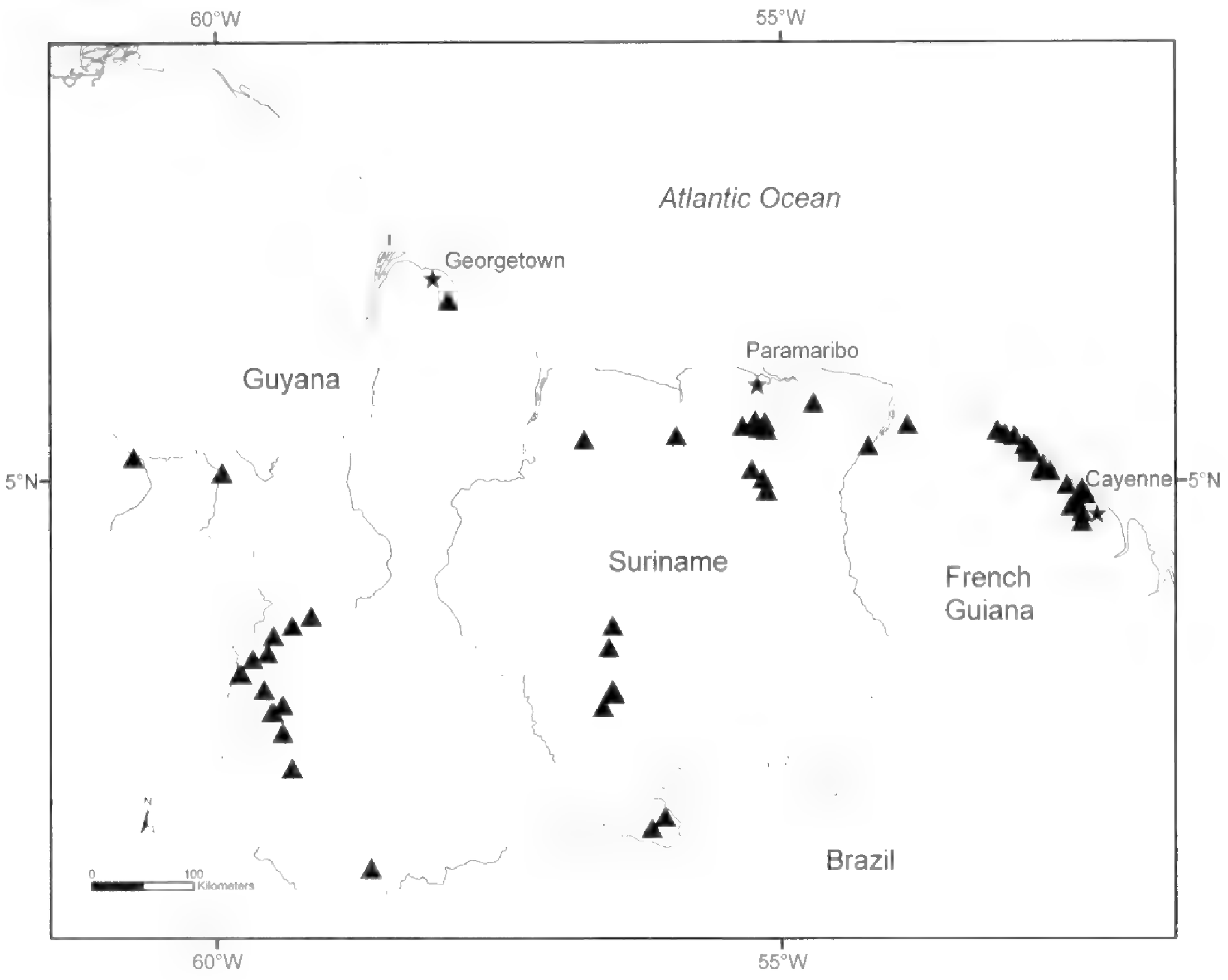

Fig. 23. Distribution of *Rhynchospora filiformis* in the Guianas.

Specimens examined: FRENCH GUIANA: Cayenne, 1835, *M. Leprieur 67* (G, P); Mana, 1855, *P. Sagot 651* (BM, G, K, P-2); Ile de Cayenne, Pont sur la crique de Cabassou, 24 Sep 1974, *Lescure 282* (CAY); Village Arawak de Ste Roxdedima, 23 May 1981, *F. Capus 227* (CAY); Cayenne, route du Tour de l'Ile, PK 10 dans un marécage, 3 Aug 1982, *A. Fournet 238* (CAY, NY, P); Plaine de Kaw, Crique Angélique. Marécage á Euterpe oleraceae, 13 Apr 1984, *J.J. de Granville 6800* (NY); Mare aux Caimans, Plaine de Kaw, 5 m, 04°39'N, 52°08'W, 13 Nov 1987, *J.J. de Granville 10128* (CAY, NY); Commune de Mana, Estuaire de la Mana, 10 m, 14 Apr 1989, *G. Cremers & M. Hoff 10600* (B, CAY, NY, P, U, US); Digue Yiyi, Région littorale, 2 m, 05°25'N, 53°04'W, 26 May 1992, D. Toriola-Marbot & M. Hoff 139 (CAY, GENT); Dégrad Canard, Bassin de la Basse-Mana, 10 m, 05°38'N, 53°48'W, 25 Mar 1992, *G. Cremers & M.N.C. Bastos12850* (CAY); Ile de Cayenne, 8 Jun 1994, *S. Albertini 169* (CAY); Crique Cabassou, Ile de Cayenne, 3 m, 04°54'N, 54°18'W, 14 Aug 2002, *J.J. de Granville & F. Crozier 15576* (CAY, P, US); Savane Angélique, Marais de Kaw, station flottante, 1 m, 04°38'43"N, 52°09'38"W, 16 Feb 2002, *J.J. de Granville & F. Crozier 14654* (CAY, GENT, US). GUYANA: Hooroobea Savanna, Apr 1887, *G.S. Jenman 3715* (K, U, US); Lama Savanna, Apr 1889, *G.S. Jenman 6124, 6125* (K); Lama Savanna, 06°33'N, 57°57'W, Apr 1889, *G.S. Jenman 6123* (K, NY, US); Anabisi, Itabu, 11 Nov 1908, *C.W. Anderson 233* (K); SE of Georgetown, East Coast Water Conservancy, 25 Nov 1919, *A.S. Hitchcock 16889* (NY, US); Wanama River, 07°45'N, 60°15'W, 10-23 May 1923, *J.S. de la Cruz 3971* (F, US); Amakura River, 08°10'N, 60°00'W, 20-23 Mar 1923, *J.S. de la Cruz 3544* (F, NY, US); Waini River, 08°20'N, 59°40'W, 3-18 Apr 1923, *J.S. de la Cruz 3802* (F, NY, US); canals near Wales, 10 mi. SW of Georgetown, 0-3

m, 26 Aug 1955, *E.L. Little Jr. 16752* (US); Skeldon area, nearly 100 mi. SE of Georgetown, <3 m, 22 Oct 1955, *E.L. Little Jr. 16934* (US); Annandale, Essequibo, 19 Jun 1960, *S.A. Harris TP441* (BRG); Boerasirie Conservation scheme, Warimia, Essequibo, 19 Jun 1960, *V. Graham 421* (K); St. Deny's, 2 mi. N of Essequibo, 21 Aug 1970, *University of Guyana Field Group 21* (BRG); Mainstay Lake, Essequibo Lake, 1-2 m, 11 Jul 1975, *R. Persaud & S. Sukdeo 11* (BRG); Mainstay Lake, Essequibo River, 2 m, 21 Jul 1975, *Z. Bacchus & R. Persaud 6* (K); Lama, Mar 1974, *A. Cooper 430* (U); Mainstay Lake, 07°15'N, 58°32'W, 0-10 m, 21 Apr 1989, *L.J. Gillespie & H. Persaud 1093* (NY, U, US); Lake Tapakuma, Reservoir, Tapakuma Water Conservancy, about 65 km NW of Georgetown, 07°15'N, 58°35'W, 5 Mar 1991, *C.N. Horn et al. 4529* (U, US); Lamaha Canal, between Cane Grove and 7 km S of Mahaica, 06°37'N, 57°56'W, 0-5 m, 11 Nov 1991, *L.J. Gillespie 4259* (NY, US); Farm-resort 2 km E of Timehri Airport, 0.2 km to E of main house, 06°30'N, 58°13'W, 0-10 m, 22 Jan 1992, *B. Hoffman & C. Capellaro 782* (NY, US); Quacqal backdam, Moruca River, 10 Sep 1997, *Tinde van Andel et al. 1895* (U, US); Yarakabra Creek near Madewini River, Ceiba Biological Station, between Linden-Soesdyke highway and Demerara River, 06°29'50"N, 58°13'W, 15 m, 28 Jun 1997, *T.H. Hollowell 227* (US). SURINAME: prope Albina, Fluv. Marowijne, 1901!, *Went 477* (U); Maratakka Rivier, 15 Feb 1915, *J.W. Gonggrijp & G. Stahel 984* (U); Courantyne Rivier, Kaboeri, 26 Jun 1916, *J.W. Gonggrijp 2235* (U); Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp,10 Aug 1949, *J. Lanjouw & J.C. Lindeman 1324* (U); Via secta ab Wiawia Bank ad Grote Zwiebelzwamp, bos bij km 10.5, 25 Nov 1948, *J. Lanjouw & J.C. Lindeman 1281* (NY, U); Via secta ab Wiawia Bank ad Grote Zwiebelzwamp, 27 Nov 1948, *J. Lanjouw & J.C. Lindeman 1323* (U); Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp, in de grote Zwiebelzwamp bij km 18.1, 10 Aug 1949, *J. Lanjouw & J.C. Lindeman 1028* (NY, U); Lely dorp, Chririapoer, 30 Aug 1949, *D.G. Geyskes s.n.* (U); Rijsdijkweg, concession Tjin A Die, ca. 25 km S of Paramaribo, 15 Aug 1953, *J.C. Lindeman 4499* (U); Rijsdijkweg, concession Tjin A Die, ca. 25 km S of Paramaribo, 4 Sep 1953, *J.C. Lindeman 4616* (U); Algemeen in droge swamp langs Powakka Kreek, 16 Oct 1954, *A.M.W. Mennega 303* (NY, U); Pad van Wanica, 1958!, *Ir J.G.P. Dirven 652* (U); W van Christiaankondre, 8 Nov 1971, *T.R. Narain LBB14197* (U); Nanni Rivier, 12 May 1974, *P.A. Teunissen LBB14936* (U).

36. Rhynchospora globosa (Kunth) Roem. & Schult., Syst. Veg. 2: 89. 1817. *Chaetospora globosa* Kunth in Humboldt, Bonpland, & Kunth, Nov. Gen. Sp. 1 (quarto ed.): 230. 1816, non *Schoenus globosus* Kunth, 1816. TYPE: Venezuela; Orinoco River near San Fernando de Atabapo, *Humboldt & Bonpland s.n.* (holotype: P-HBK). Figs. 25, 55C-D.

Rhynchospora epiglobosa C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 34. 1908. *Rhynchospora globosa* var. *epiglobosa* (C. B.Clarke) Kük., Bot. Jahrb. Syst. 74: 465. 1949. TYPE: Belize; Pine Ridge, *Campbell 44* (holotype: K; isotype: NY).

Cephaloschoenus globosus var. *minor* Nees in Martius, Fl. Bras. 2:130, 1842. SYNTYPE: Guyana, *Schomburgk 655* (P).

Rhizomatous perennial, 30-115 cm tall; rhizome short, the culms solitary or borne tightly together in a row along rhizome, or sometimes caespitose; roots coarse, 1-3 mm thick; sheathing base of culm 7-22 mm wide. Culms ascending, 0.7-2.3 mm wide, trigonous to obtusely trigonous, hardened, coarsely ribbed, green, glabrous, clavate at apex just below inflorescence head. Leaves 6-30 per culm, primarily basal, often 1-3 cauline just above base, stiffly erect to ascending, 8.5-70 cm long; sheaths eligulate, short, stiff, coriaceous, indistinctly finely veined with indistinct cross partitions between veins, shiny, subsmooth and coriaceous abaxially, smooth with soft and spongy epidermis that is often cross-puckered adaxially, brown to brown-black or black, glabrous, the inner band membranous, deeply U-shaped on upper sheaths, concave to truncate on lower sheaths; blades linear, 1-4 mm wide (flattened), with indistinct cross partitions between veins, V-shaped in cross section, subtrigonous distally, stiff, smooth, indistinctly finely veined, green, glabrous, margins remotely scabrous to smooth on older well-developed leaves, antrorsely scabrous to ciliate-scabrous on young leaves, ciliate-scabrous near base on cauline leaves. Inflorescence a single hemispherical to subglobose congested head of spikelets at summit of culm, 9-20 × 8.5-22 mm; involucral bracts 5-9 (immediately surrounding spikelets, often more interspersed among

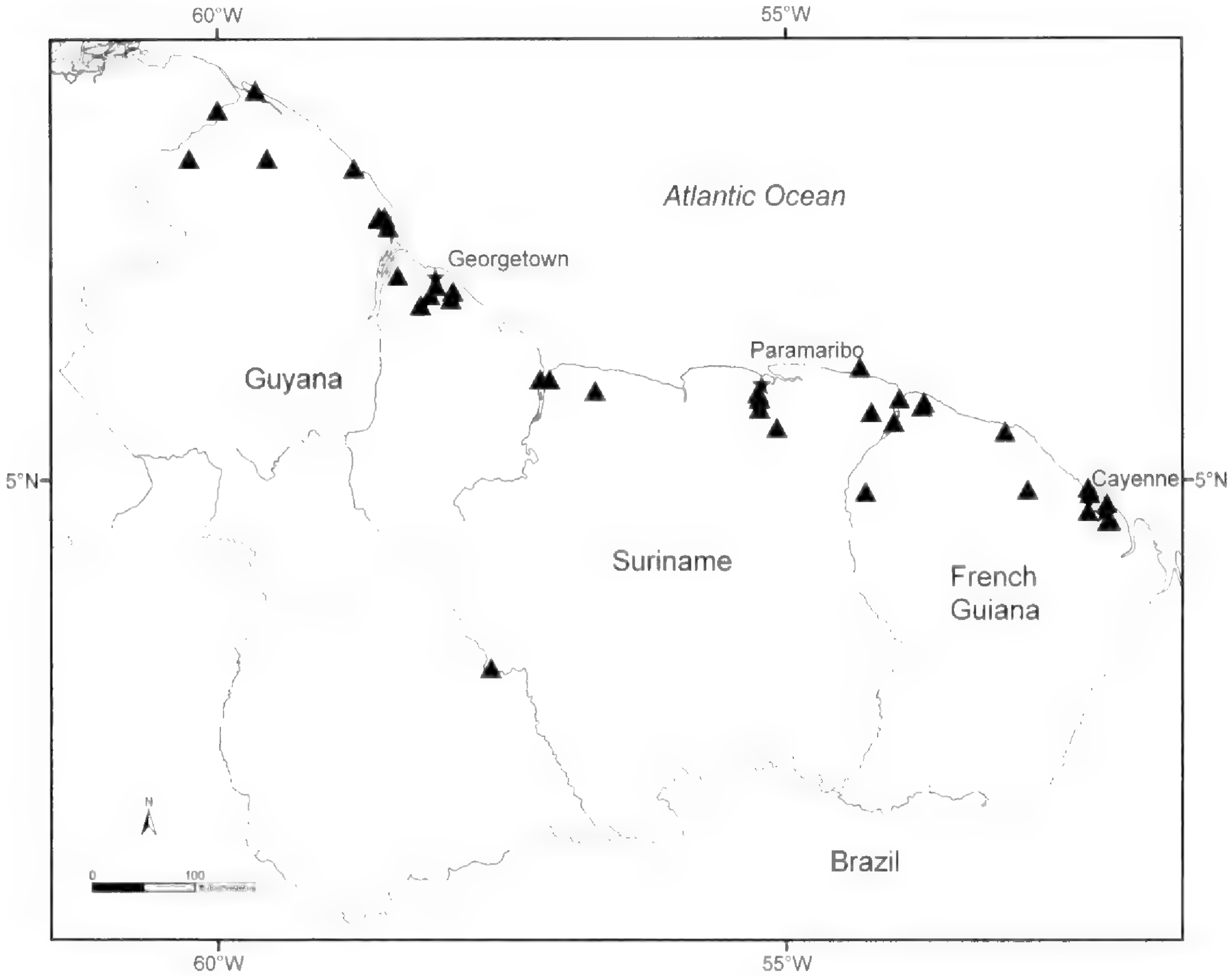

Fig. 24. Distribution of *Rhynchospora gigantea* in the Guianas.

spikelets), scale-like, 6-8 × 2.8-6.5 mm, indurate, stiff and cartilaginous, broadly ovate to broadly rectangular or broadly obovate, the apex obtuse to truncate or emarginate, light brown to yellow-brown, ciliate to glabrate along margins, the lowest often leaf-like with a blade 0.7-20 cm long, exceeding the spikelets; spikelets numerous, ovate-lanceolate to narrowly elliptic-lanceolate, often curvate, acuminate at apex, short-cuneate at base, 7-9 × 1.2-2 mm, densely aggregated; scales 7-12 per spikelet, herbaceous to thickened and subcartilaginous, acute to narrowly obtuse in cross section, indistinctly very finely veined, uniformly light brown to brown or whitish stramineous, glabrous, margins scarious, acute to obtusely or acutely rounded at apex on lower fertile and sterile scales, acuminate at apex on upper fertile scales, midcosta pale green, indistinct, prolonged beyond apex as a short mucro on proximal scales, glabrous to ciliate-scabrous distally; fertile scales 4-6, ovate-elliptic to ovate-lanceolate, upper fertile scales narrowly ovate-lanceolate, (4.9-) 5-8 × 1.5-4 mm; sterile scales 3-6 (excluding 2-keeled prophyll at base), ovate-lanceolate to ovate-elliptic, 2-4.5 × 0.8-3.4 mm. Stamens 2 or 3, the anthers 2.3-3.5 mm long, long-apiculate at apex, truncate and papillate at base; style entire to shortly bifid at tip, reddish. Achene biconvex to subplano-convex, oblong-obovate to narrowly oblong-obovate or obovate, (2-) 2.1-2.8 (-3) × 1.1-1.5 mm, minutely indistinctly cellular-reticulate (appearing smooth), light brown, cuneate to base, obtuse to subtruncate at apex, the margins and sides at apex often with crystalline prickles; epidermal cells isodiametric to somewhat vertically elongated, no central nodules evident; style base triangular with 2 rounded basal lobes that overlap on either side of achene body, 0.6-1 mm long, 0.5-0.7 mm wide at

base, pale brown, the apex truncate with 2 teeth on each margin, sometimes with 2 medial smaller teeth as well; bristles 5-6, 3-5 mm long, equaling to overtopping style base (longer than achene body), plumose, with ascending hairs, reddish, the apex antrorsely barbed.

Distribution: Mexico, Central America (Guatemala, Honduras, Nicaragua, Costa Rica, and Panama), Greater Antilles (Cuba), Trinidad, South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Peru, Brazil, Bolivia, Paraguay, Argentina).

Habitat in the Guianas: White-sand savanna or sandy clay savanna, 0-1100 m.

Specimens examined: FRENCH GUIANA: no locality given, no date given, *M. Leprieur s.n.* (P, U); no date given, *H. Jelski s.n.* (US); Exploitation maiaîcgeù de B.GIRARD à Sinnamary, no date given, A. Leclerc 300 (CAY); Môrro de Pariacabo, 23 Oct 1954, *G.A. Black & Klein 54-17192* (CAY); Campo úmido, estrada de Sinnamary para Organabo, 20 Oct 1954, *G.A. Black et al. 54-17042* (CAY); Campo de Passoura, Lote no. 9, 26 Oct 1954, *G.A. Black & Klein 54-17277* (CAY); Sud de Cayenne, ancien aérodome de Gallion entre le pont du tour de l'Ile et le Gallion, 13 Jan 1974, *C. Descoings & Cl. Luu 20117* (CAY); Au sud de Tonate, à environ 4km sur la rte de Gallion à partir du croisement Cayenne-Kourou, 16 Jan 1974, *C. Descoings & Cl. Luu 20177* (CAY, P); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 25 Feb 1977, *G. Cremers & Y. Veyret 4375* (CAY, FTG); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 10 Mar 1977, *G. Cremers & Y. Veyret 4432* (CAY, FTG, P), *4438* (CAY, FTG); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 21 Dec 1977, *G. Cremers 5202* (CAY-2, FTG, P); Savane de Corossony, sur la piste de St. Elie, 4 à 7 km à l'WSW de Sinnamary, 5 Jan 1978, *A. Raynal-Roques 19763* (CAY, P); Savane au début de la piste de St. Elie, 30 Jun 1983, *C. Feuillet 994* (CAY); Route du Gallion, Route du Tour de I'Ile de Cayenne, N 2 entre les PK 15 et 16, 10 m, 13 Dec 1986, *G. Cremers 9491* (B, CAY, MO, NY, P, U, US); Savanne Macrabo, Région de Cayenne, 20 m, 04°47'N, 52°22'W, 8 Dec 1988, *M. Hoff 5446* (B, CAY, NY, P); Savane Aubanèle, Bassin du Kourou, SSW Kourou, 20 m, 05°07'N, 52°41'W, 9 Jun 1989, *G. Cremers & M. Hoff 10735* (CAY); Savane incluse "Agami", 05°15'28"N, 52°48'37"W, 8 Mar 1995, *L. Cadamuro & Solacroup 400* (CAY); Savane "Route de l'espace", 05°11'11"N, 52°43'07"W, 6 Mar 1995, *L. Cadamuro & Solacroup 382* (CAY); Savane Karouabo 2, 05°14'42"N, 52°47'09"W, 1 Feb 1995, L. *Cadamuro & Solacroup 34* (CAY); Savane incluse "Agami", 05°15'28"N, 52°48'37"W, 8 Mar 1995, *L. Cadamuro & Solacroup 390* (CAY). GUYANA: Rupununi, Apr 1839, *R. Schomburgk 655* (BM, F, G, K, P, US); Upper Rupununi, 20 Jun 1864, *C.F. Appun 2355* (K); Without locality, 1866, *C.F. Appun 1847* (K); Baramaticoo savanna, Dec 1907, *Herbarium 95* (BRG, K); Paramacatoi savanna, Ireng District, May 1926, *R.A. Altson 503* (K, NY, P); Annai savanna, Rupununi, 150 ft, 3 Feb 1931, *E.B. Martyn 343a* (K); between Takutu River and Kanuku Mountains, 12-22 Mar 1938, *A.C. Smith 3266* (F, G, K, MO, NY, P, U, US); Rupununi savanna, 1 1944, *H. Field s.n.* (F); Kamarang River, Wenamu Trail, 1100 m, 10 Nov 1951, *B. Maguire & D.B. Fanshawe 32542* (NY); Rupununi savanna, near Kanuku Mountains, 14 Feb 1959, *J. Lanjouw et al. 748* (U); North Rupununi, Apr 1968, *D.H. Davis 761* (BRG, K, NY); Annai savanna, Rupununi, 150 ft, 26 Dec 1960, *V. Graham 513* (K); Sand Hills, W of Abary River, 4 Oct 1981, *P.J.M. Maas et al. 5505* (F, K, MO, NY, P, U); Makatui savanna, ca. 3.5 km SW of Aishalton, 17 Nov 1982, *A.L. Stoffers et al. 354* (U); 5 km SE of Aishalton, near Lake Awakawau, 20 Nov 1982, *A.L. Stoffers 511* (B, CAY, U); Gunn's, Essequibo River, 240-260 m, 3 Sep 1989, *M.J. Jansen-Jacobs et al. 1425* (B, CAY, K, NY, U, US); Sand Creek Village, 3 km E of junction of Rupununi & Katawau Rivers, 1 km S of village, 03°00'N, 59°31'W, 100 m, 21 Jun 1989, *L.J. Gillespie et al. 1703a* (US); Pakaraima Mountains, 0.5 km NW of Imbaimadai settlement, 05°42'N, 60°17'W, 525-575 m, 17 Nov 1992, *B. Hoffman 3425* (NY, US); Baranka Landing, Piruru Savanna, 05°11'21"N, 57°17'07"W, 20 m, 1 Apr 1995, *P. Mutchnick 1148* (US); Dadanawa, Tawatawun Mountain, 100-150 m, 8 Jun 1995, *M.J. Jansen-Jacobs et al. 3994* (U, US); Gunn's Strip, airstrip 2 km W of village & Essequibo River, 01°39'05"N, 58°38'50"W, 240 m, 18 Sep 1998, *H.D. Clarke et al. 7882* (US). SURINAME: Apikollo, 29 Jan 1911, *J.F. Hulk 47* (U); Near Brownsweg, 11 Nov 1933, *J. Lanjouw 1236* (U); near Brownsweg, 13 Nov 1933, *J. Lanjouw 1259* (K, MO, NY, U); Moengo tapoe ad Grote Zwiebelzwamp, 29 Sep 1948, *J. Lanjouw & J.C. Lindeman 555* (U); Moengo tapoe ad Grote Zwiebelzwamp, 29 Sep 1948, *J. Lanjouw & J.C.*

Lindeman 584 (U); Moengo tapoe ad Grote Zwiebelzwamp, 8 Oct 1948, *J. Lanjouw & J.C. Lindeman 752* (U); Tibiti Savanne, 5 Jan 1949, *J. Lanjouw & J.C. Lindeman 1609* (F, K, NY, P); Tibiti Savanne, near km 0.5, 8 Jan 1949, *J. Lanjouw & J.C. Lindeman 1726* (K, MO, NY, U); Savanna bij km 103 langs spoorlijn, 16 Mar 1949, *J. Lanjouw & J.C. Lindeman 3333* (U); Savanne langs spoorlijn langs km 106 [between km 72 and Kabelstation], 22 Apr 1949, *J. Lanjouw & J.C. Lindeman 3029* (NY, U); Boven-Sipaliwini, 2 May 1952, *D.G. Geyskes s.n.* (U); Kasiwinika (Cassewinica) Kreek, near Kopie, 15 Jul 1953, *J.C. Lindeman 4289* (U), *4316* (U, US); Lobin-savanna inter Zanderij I & Hannover, Aug 1958, *J. van Donselaar & W.A.E van Donselaar 399* (NY); Coesewijne Savanne, 4 Dec 1958, *J. van Donselaar 502* (U); Lobin-savanna inter Zanderij I and Hannover, 22 Jan 1959, *J. van Donselaar & W.A.E. van Donselaar 450* (U); Brownsweg, 6 Apr 1961, *K.U. Kramer & W.H.A. Hekking 3232* (U); Zuid Rivier, savanne naast Kayser vliegv, 13 Aug 1963, *J.P. Schulz 10394* (U); Hemige grass savanna ann W oever van Maratahlin bij Sapana Kreek, 10 May 1965, *P.J.M. Maas et al. 3246* (U); Saparra Kreek Savanne, 10 May 1965, *P.J.M. Maas et al. 3253* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 16 Oct 1967, *P.A. Teunissen & J.T. Wildschut LBB11814* (U); Sipaliwini Savanne area on Brazilian frontier, Little Sipaliwini Savanne in E-transect, 320 m, 30 Dec 1968, *F.H.F. Oldenburger et al. 712* (U); Sipaliwini Savanne area on Brazilian frontier, S of "4-Gebroeders" Mountains, 305 m, 25 Nov 1968, *F.H.F. Oldenburger et al. 168* (U); Sipaliwini Savanne area on Brazilian frontier, 29 Jan 1970, *F.H.F. Oldenburger et al. 1066* (U); Coesewijne Savanne, W v., 31 Mar 1976, *P.A. Teunissen LBB15499* (U).

37. Rhynchospora harperi Small, Man. S.E. Fl. 182, 1503. 1933. TYPE: United States; Georgia, Pulaski County, wet pine barrens about 3 mi. E of Hawkinsville, *Harper 1377* (holotype: NY; isotype US!). Figs. 26, 67C-D.

Caespitose perennial, 25-70 cm tall; rhizome short, inconspicuous; roots fine to medium; sheathing base of culm 1-2 mm wide. Culms slender, erect to ascending, (0.6-) 0.7-1.4 (-1.5) mm wide, trigonous with blunt angles, subterete distally with a single flattened to shallowly canaliculate side, often scabrous on the edges, finely ribbed, smooth, glabrous, light green. Leaves 3-15, ascending, basal and cauline, elongate, (8-) 15-35 cm long; sheaths finely veined, glabrous, pale brown to stramineous, with a membranous inner band and concave to truncate orifice, splitting with age, the cauline sheaths with a herbaceous inner band and concave to truncate, scarious-tipped orifice; ligule absent; blades narrowly linear, V-shaped to folded in cross section, 0.7-2 mm wide, finely veined, green, glabrous, antrorsely scabrous on margins distally, very long-acuminate to a trigonous-subulate apex. Inflorescence a terminal and 1 or 2, remote to subcontiguous, small, turbinate to hemispherical fascicles of spikelets from the upper leaf-like bracts; bracts reduced distally, overtopping subtending fascicles; fascicles 4-10 mm in diam, with 5-30 spikelets; peduncles slender, 0.4-0.6 mm wide, trigonous to subterete in cross section, finely ribbed, smooth to antrorsely scabrous on angles or edges distally, the sides glabrous; fascicle branches short, trigonous, each subtended by a bract at both base of branches and spikelet pedicels, the lower bract ovate-lanceolate, blade-bearing, long-awned, glabrous, scabrous on margins, the upper bract smaller, oblong-ovate, truncate to emarginate at apex, 2-veined, unawned, essentially glabrous. Spikelets narrowly ovoid-ellipsoid, narrowly acute to acuminate at apex, cuneate at base, mature fruiting spikelets 4-5 × 0.8-1.2 mm, reddish brown to brown, short-pedicellate or subsessile, the pedicels essentially glabrous; scales 5-7 per spikelet, thin, reddish brown to brown, glabrous, with a single, inconspicuous, pale brown or greenish midcosta, prolonged beyond the acute to acuminate apex as an antrorsely scabrous awn; fertile scales 2 or 3, all subtending bisexual flowers, 3.5-4.1 × 2-3 mm, widely ovate, inrolled around developing flower, the awns 0.3-0.5 mm long; sterile scales 3 or 4 above base, smaller than the fertile, ranging from 1.6-3.6 × 0.8-2.2 mm, ovate to oblong-ovate, the awns slightly longer than those of fertile scales. Stamens 3, or 2 and 1 abortive, the anthers linear, 0.8-1.6 mm long, reddish, the connective prolonged at apex as a linear-subulate appendage, truncate and minutely lobed at base; styles 2-branched, glabrous, the branches about as long as the unbranched portion. Achene biconvex, with convex or bulging centers, obovate, subabruptly rounded to a truncate apex, 1.3-1.5 × 0.9-1.1 mm, shiny, faintly very finely transversely rugulose or sometimes smooth

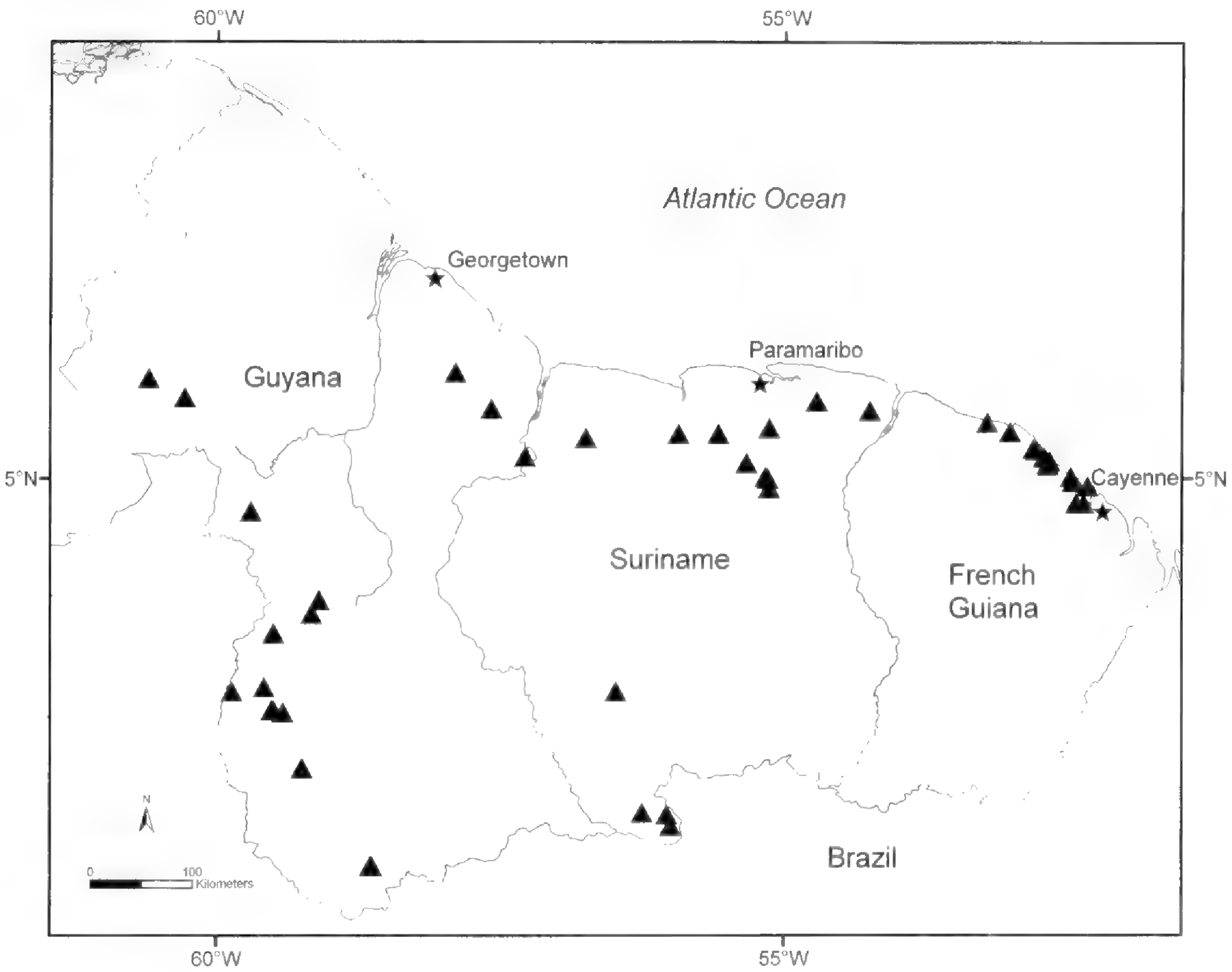

Fig. 25. Distribution of *Rhynchospora globosa* in the Guianas.

medially, orange-brown, often with light brown center; epidermal cells isodiametric, no central nodules evident; style base triangular-lanceolate, 0.9-13 mm long, 0.6-0.8 mm wide at base, flattened, narrower than achene, shallowly sulcate on sides, antrorsely spinulose-scabrous on margins, pale brown; bristles 6, subulate, antrorsely barbed, sparsely plumose at base, reddish brown, overtopping the achene, equaling or exceeding the style base.

Distribution: Southeastern United States, Central America (Honduras), and northern South America (Guyana and Suriname).

Habitat in the Guianas: Wet depressions in white-sand savanna, creek margins, and swampy areas on floating peat, at or near sea level.

Discussion: Although recorded from Honduras, this is primarily a species of the southeastern United States disjunct from its typical habitat in pineland savannas of Georgia and Florida. Lindeman and Van Donselaar (1971) incorrectly cited the Suriname material as *R. filifolia* A. Gray.

Specimens examined: GUYANA: Soesdyke, Oct 1973, *A. Cooper 324* (U); Soesdyke, Jan 1974, *A. Cooper 443* (U). SURINAME: Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp in Grote Zwiebelzwamp near km 18, 21 Oct 1948, *J. Lanjouw & J.C. Lindeman 953a* (U); Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp in Grote Zwiebelzwamp near km 18, 21 Oct 1948, *J. Lanjouw & J.C. Lindeman 1002* (U).

38. Rhynchospora hassleri C. B. Clarke, Bull. Herb. Boissier, sèr. 2, 3: 1023. 1903. TYPE: Paraguay; "Funnen Opa" [Flumen Apa], *Hassler 8255* (holotype: K!; isotype: NY!). Figs. 26, 57A-B.

Rhynchospora viridi-lutea C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 36. 1908.

LECTOTYPE: Guyana (British Guiana), *Parker s.n.* (K), designated by T. Koyama, Mem. New York Bot. Gard. 23: 49. 1972.

Rhizomatous perennial, (45-) 50-130 cm tall; rhizome short, stout; roots coarse, 1-2 mm thick; sheathing base of culm 8-15 mm wide. Culms ascending, (1-) 2-7 wide, trigonous to triquetrous, sharply angled, hardened, finely ribbed, green, glabrous. Leaves 5-9, ascending, primarily basal, 1-3 cauline, 40-100 cm long; sheaths eligulate, elongate, up to 25 cm long, spongy-thickened, finely veined with inconspicuous cross partitions between veins to sometimes conspicuously so, brown to pale brown, glabrous, inner band membranous on basal leaves, herbaceous on cauline leaves with only the orifice membranous, the orifice convex; blades narrowly linear, 5.5-14 mm wide (unfolded), spongy-thickened proximally, V-shaped proximally to flattened or subplicate distally, herbaceous, finely veined, subglossy and dark green adaxially, dull and often a lighter green abaxially, smooth, glabrous, margins antrorsely scabrous distally on margins and abaxial midvein, the apex attenuate to triquetrous apex. Inflorescence a terminal and often 1 or 2 lateral, lax, corymbose partial panicles below from the upper leaf-like bracts, rarely a single glomerule of spikelets at the summit of the culm; bracts elongate, exceeding subtending corymbs; terminal corymb 5.5-20 × 3-14 cm, the spikelets in hemispherical to subglobose clusters at branch tips, 1-1.9 × 1.7-2.5 cm, 6-20 spikelets per cluster; corymb branches terete to subflattened, finely ribbed, glabrous; spikelets ovate with acuminate apex, subrounded to rounded at base, (6.5-) 7-9.5 (-10) × (2.2-) 2.5-3.7 (-4) mm; scales 5-8 per spikelet, thin and submembranous or the terminal two of spikelet membranous, often adherent to each other, boat-shaped or subfolded (like grass lemmas) in cross section, acute to acuminate at apex, often cross-puckered medially, subglossy, smooth, glabrous, olive brown to dark brown, margins with broad pale or whitish scarious margins, the midcosta very narrow, inconspicuous, dark brown near apex; fertile scales 2-4, 2 lowermost subtending bisexual flowers, these tightly surrounding flowers or achenes, somewhat adherent to each other, the terminal 1 or 2 scales staminate only with abortive pistil, very widely ovate except for two terminal ones which are ovate-lanceolate, (4.5-) 5-8.8 × 3-5 (-5.5) mm; sterile scales 3(-4) below fertile, ovate to widely ovate, 2-6.8 × 2-4.2 (-4.5) mm, the uppermost like the fertile in size. Stamens 3, the anthers 2-4 mm long, apiculate at apex, truncate and minutely lobed at base; style entire or shortly bilobed at tip. Achenes 2-sided, plane to slightly concave on abaxial side and convex on adaxial side, elliptic-obovate, 4.3-4.8 × 1.8-2 mm, subabruptly narrowed to base, rounded at apex, pale brown or grayish green, with puncticulate surface, the margins at base bearing two thickened lanceolate pale appendages with blunt apex, ca. 1 mm long; epidermal cells isodiametric with conical central nodules, few buttresses evident; style base flattened, 2-sided or 4-angled with two wide and two very narrow sides, 3.2-4.7 mm long, 0.3-0.6 mm wide at base, lance-attenuate, antrorsely scabrous on angles, light brown to dark brown, the base articulated with apex of achene body; bristles 6, filiform, straight, 6.2-8 mm long, pale, antrorsely barbed, with minute dark brown to blackish barbs, exceeding the achene body, shorter than tip of style base.

Distribution: Central America (Honduras, Nicaragua, and Costa Rica), and South America (Venezuela, Guyana, Suriname, Brazil, Bolivia, and Paraguay).

Habitat in the Guianas: Swampy areas, wet or flooded savanna, and palm swamps, 0-200 m.

Specimens examined: GUYANA: Without locality, 1867, *W. Parker s.n.* (K-2); Kamakusa, Upper Mazaruni River, 59°50'W, 11-22 Jul 1923, *J.S. de la Cruz 4064* (F, MO, US); Wakapoa, 24 Dec 1958, *V. Graham 222* (K); Rupununi District, Manari, 22 Oct 1979, *P.J.M. Maas et al. 3756* (U); South Rupununi savanna; Keridwau Creek, 02°30'N, 59°18'W, 200 m, 12 Feb 1994, *T.W. Henkel & R. James 3737* (US); Acquero Savanna, Moruca River, 21 Oct 1997, *Tinde van Andel & Harry Olde 2519* (U, US). SURINAME: Houttuinweg, kleigrond, sawah, Feb-Mar 1958, *Ir J.G.P. Dirven LBB625* (U); Landbouwproefstation, Feb-Mar 1958, *Ir J.G.P. Dirven 625* (U); Houttuinweg, kleigrond, sawah, Feb-Mar 1958, *Ir J.G.P. Dirven 626* (U); Houttuinweg, kleigrond, sawah, Feb-Mar 1958, *Ir J.G.P. Dirven 627* (U); Houttuinweg, Feb 1958, Ir J.G.P. Dirven, *Agricultural Experiment Station 627* (U, US); Sipaliwini Savanne, 9 Sep 1966, *J. van Donselaar 3718* (K, U); Beneden Marowijne, 8 Nov 1971. *T.R. Narain LBB14196* (U).

39. Rhynchospora hirsuta (Vahl) Vahl, Enum. Pl. 2: 231. 1805. *Schoenus hirsutus* Vahl, Eclog. Amer. 1: 6. 1796. *Dichromena hirsuta* (Vahl) Kunth, Enum. Pl. 2: 281. 1837. TYPE: South America, *Rohr s.n.* (holotype: C-Vahl). Figs. 27, 87C-D.

Rhynchospora venezolana Kük., Repert. Sp. Nov. Regni Veg. 53: 74. 1944. TYPE: Venezuela; Palamba, *Passarge & Salwyn 218* (holotype: B, destroyed).

Caespitose annual, 19-48 (-60) cm tall; roots slender, brown. Culms growing tightly together, ascending, (0.4-) 0.5-1 (-1.1) mm wide, trigonous with blunt angles, firm, finely ribbed, longitudinally forrowed medially on sides, green to dark green, hirsute. Leaves numerous, ascending, primarily basal, 1 or 2 cauline, (1-) 3-21 cm long; sheaths short, eligulate, finely veined, green to dark green, hirsute to glabrate, the inner band membranous, splitting with age, with a concave, hirsute to glabrate orifice, the upper sheaths membranous only at orifice; blades linear, flattened or somewhate V-shaped or folded, 1-2.3 mm wide (unfolded), finely veined abaxially, green to dark green, hirsute to glabrate abaxially, essentially glabrous adaxially with shining, minutely cellular-reticulate epidermis, margins antrorsely scabrous, at least distally, the apex acuminate, triquetrous. Inflorescence a terminal and 1 or 2 lateral, lax, corymbose partial panicles from the upper leaf-like bracts; partial panicles 1.2-6.5 × 1.3-4.5 cm, the lateral subtended by bracts that are typically narrower and shorter than leaf blades; inflorescence branches compressed-trigonous to subterete in cross section, hirsute; corymb bracts linear-lanceolate, hirsute, ciliate along margins; spikelets 10-100 per corymb, ovate-elliptic, often slightly falcate, acute at apex, shortly rounded-cuneate at base, (2.8-) 3-4.8 (-5) × 1-1.5 mm, reddish brown; scales 6-12 per spikelet, boat-shaped with obtuse to rounded keel, thinly herbaceous, glabrous, brown with darker lineations, margins broadly scarious, midcosta

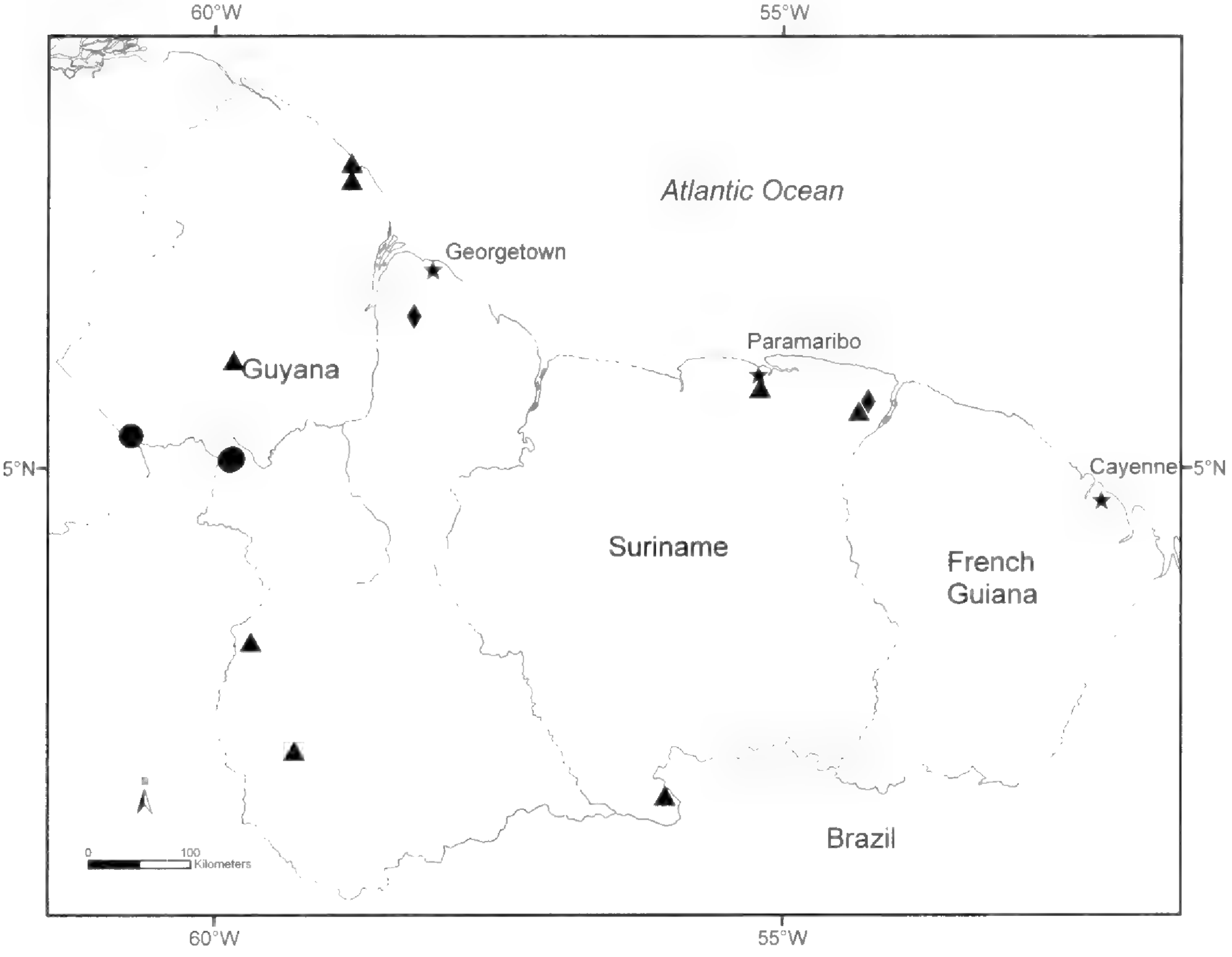

Fig. 26. Distribution of ♦*Rhynchospora harperi*; ▲*R. hassleri*; and ●*R. immensa* in the Guianas.

distinct, very fine, prolonged beyond the acute to obtuse apex as a short mucro which is often hispid distally; fertile scales 4-9, ovate to broadly ovate, 2-2.5 (-2.8) × 1.3-2 mm; sterile scales 2 or 3, ovate to broadly ovate, 1-1.2 × 0.8-1.3 mm. Stamens 2, the anthers 0.8-1 mm long, apiculate at apex, truncate and papillate at base; style distinctly 2-branched, about same length as unbranched portion of style. Achene broadly biconvex to globose or globose-obovoid, (0.5-) 0.6-0.8 × 0.6-0.8 mm, narrowly short-stipitate at base, rounded to subtruncate at apex, transversely pitted-reticulate, stramineous or green; epidermal cells rectangular, vertically oriented; style base triangular with a ± truncated apex, 0.2-0.3 mm long, 0.4-0.6 mm wide at base, spongy, pale brown to brown; bristles absent.

Distribution: southern Mexico, Central America (Guatemala, Honduras, Nicaragua, Costa Rica, and Panama), Greater Antilles (Cuba and Hispaniola), Trinidad, and northern South America (Venezuela, Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: Lowland white-sand savanna, sandy clay savanna, disturbed areas, early successional habitats, 10-150 m.

Specimens examined: FRENCH GUIANA: Cayenne, 1835, *M. Leprieur s.n.* (G); Cayenne, 1840, *M. Leprieur s.n.* (G, P); Without locality, 1854, *M. Poiteau 233* (K); Without locality,1867, *H. Jelski s.n.* (US); Without locality, without date, *H. Jelski s.n.* (US); Cayenne, without date, *Decandolle & L'heritier s.n.*? (G); Cayenne, without date, *D.C. 186* (NY); vicinity of Cayenne, 14 Jun 1921, *W.E. Broadway 491* (K, NY); Route de Cabassou, Savane Calumbe, 31 Aug 1955, *J.J. Hoock s.n.* (P); Route de Sinamary, Carrière du 16 km, 08 Jun 1962, *J.J. Hoock s.n.* (P); Kourou, savane de Passoura, 18 May 1962, *J.J. Hoock s.n.* (NY, U-2); Sinnamary, savane de Corossony, à 4 km de la route Sinnamary-Iracoubo, 28 Aug 1979, *A. Raynal-Roques 21482* (CAY); Pripris Maillard, à 4 km au SE de Tonate, 30 Aug 1979, *A. Raynal-Roques 21514* (CAY); Sinnamary, savane de Corossony, à 4 km de la route Sinnamary-Iracoubo, 28 Aug 1979, *A. Raynal-Roques 21482* (P, US); entre Kourou & Sinnamary, PK 92, 13 Aug 1982, *A. Fournet 265* (CAY, NY, P); Matoury, lac aux americains, 13 Jun 1983, *C. Feuillet 925* (NY); S. Cayenne, Lac des Americains, 13 Jun 1983, *G. Cremers 8099* (NY); Piste de St. Elie, CD-21, km 15.7, 05°25'N, 53°10'W, 100 m, 15 Sep 1987, *W. Hahn 3716* (B, CAY, NY, U, US); Savanne Mamaribo, RN 1, region littorale, 1 km E of RN 1, 10 m, 05°31'N, 53°22'W, 26 May 1989, *M. Hoff & G. Cremers 5636* (NY); Americains, commune de Matoury, without date, *C. Feuillet 922* (NY); Savane Mamaribo, RN 1, region littorale, 1 km E of RN 1, 10 m, 05°31'N, 53°22'W, 26 May 1989, *M. Hoff & G. Cremers 5624* (NY); Dégrad Saramaca, Bassin du Kourou, SSW Kourou, 20 m, 9 Jun 1989, *G. Cremers & M. Hoff 10696* (B, CAY, G, MO, NY, P, U, US); Piste du Village Eskol, Montagne de Kaw, 5 m, 16 Sep 1992, *A. LeGoff & M. Hoff 244* (CAY, US). GUYANA: Lama Savanna, Apr 1889, *G.S. Jenman 6130* (K, NY, US); Wichabai, Rupununi River basin, 25-26 Oct 1937, *A.C. Smith 2279* (F, G, K, MO, NY, P, U, US); Annai, 28 Dec 1960, *V. Graham 482* (K); Annai, 3 Jan 1961, *V. Graham 498* (K); Yupukarri, stand 44, Rupununi, 15 Oct 1963, *R.J.A. Goodland 1011* (NY); Lethem, Rupununi savanna, Feb 1974, *A. Cooper 383* (U); Rupununi District, Manari, 22 Oct 1979, *P.J.M. Maas et al. 3741* (F, K, MO, NY, P, U); Rupununi District, Manari, 20 Oct 1979, *P.J.M. Maas et al. 3683* (K, MO, NY, U); Rupununi Distr: Caakoitou, near Mt Point, just S of Kanuku Mountains, 02°56'N, 59°40'W, 25 Oct 1981, *P.J.M. Maas & L.Y. Th. Westra 4032* (K, NY, P, U); Sand Hills, W of Abary River, 4 Oct 1981, *P.J.M. Maas et al. 5509* (K, MO, NY, U); Digitima Savanna, Canje River, ± 185 km from mouth of Canje, 05°33'N, 57°40'W, 10-20 m, 30 Oct 1989, *L.J. Gillespie et al. 2543* (NY, US); Lama Savanna, 06°33'N, 57°57'W, Apr 1889, *G.S. Jenman 6131* (BRG, K, MO, NY, U, US); Rupununi District, between Dadanawa and Mountainpoint, 100-150 m, 3 Oct 1992, *M.J. Jansen-Jacobs et al. 2728* (B, CAY, F, MO, NY, P, U, US); Jerome's Place, Talidku Mountain, 140 m, 7 Sep 1995, *M.J. Jansen-Jacobs et al. 5024* (U, US); Rupununi Northern Savanna, Mackiedon Dam, just S of large airstrip, 3 mi. NW of Karanambo, 03°45'N, 59°10'W, ca. 80 m, 22 Oct 1996, *C.N. Horn & J. Wiersema 11064* (US). SURINAME: Upper Sipaliwini area, 02°00'N, 56°09'W, 4 Sep 1966, *J. van Donselaar 3676* (U); Sipaliwini Savanne, 9 Sep 1966, *J. van Donselaar 3708* (U); Copie Savanne, Casewinica, District Commewijne, 5 Nov 1976, *P.A. Teunissen LBB16060* (U).

40. Rhynchospora holoschoenoides (Rich.) Herter, Revista Sudamer. Bot. 9: 157. 1953. *Schoenus holoschoenoides* Rich., Actes Soc.

Hist. Nat. Paris 1:106. 1792. TYPE: French Guiana, *D. LeBlonde 36* (holotype: P; isotype: P). Figs. 28, 56A-B.

Schoenus cyperoides Sw., Prodr. 19. 1788, non Retzius, 1786; *Rhynchospora cyperoides* Mart., Denkschr. Königl. Acad. Wiss. München 6: 149. 1817 ("1816") and Britton, Trans. New York Acad. Sci. 11: 84. 1892. TYPE: Jamaica, *Swartz s.n.* (holotype: S-Sw., #R-5609).

Schoenus fragiferus Rudge, Pl. Guian. 15, t. 17. June, 1805. TYPE: French Guiana, *Martin s.n.*. (holotype: BM!).

Rhynchospora heterocaulis C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 32. 1908 (in part). SYNTYPES: Suriname. *Berthoud-Coulon 52* (BM!); Brazil. *Sellow s.n.* (BM!).

Note: Only taxa based on Guiana specimens are listed above. See Koyama (1972) for full list of synonyms.

Rhizomatous perennial, 45-101 cm tall; rhizome short, thickened; roots coarse, brown; sheathing base of culm 5-15 mm wide. Culm ascending, 1.3-3 mm wide, trigonous, firm, longitudinally ribbed, green, smooth, glabrous, the angles smooth to bluntly scabrous distally. Leaves 7-12, ascending, primarily basal, 2-4 lower cauline, 13-75 (-82) cm long; sheaths ligulate, with a very narrow, thickened band or flap of tissue at adaxial junction of sheath and blade, inconspicuous on upper sheaths, herbaceous, often spongy-thickened, finely veined with cross partitions between veins, green to pale brown proximally, glabrous, the inner band membranous on lower sheaths, splitting with age, membranous only at orifice on upper sheaths, purple-dotted, finely veined, prolonged at orifice, obtuse or rounded at summit, often cross-puckered; blades narrowly linear, 2.2-6 (-6.5) mm wide unfolded, flattened distally, often folded and spongy-thickened proximally, herbaceous, finely veined with cross

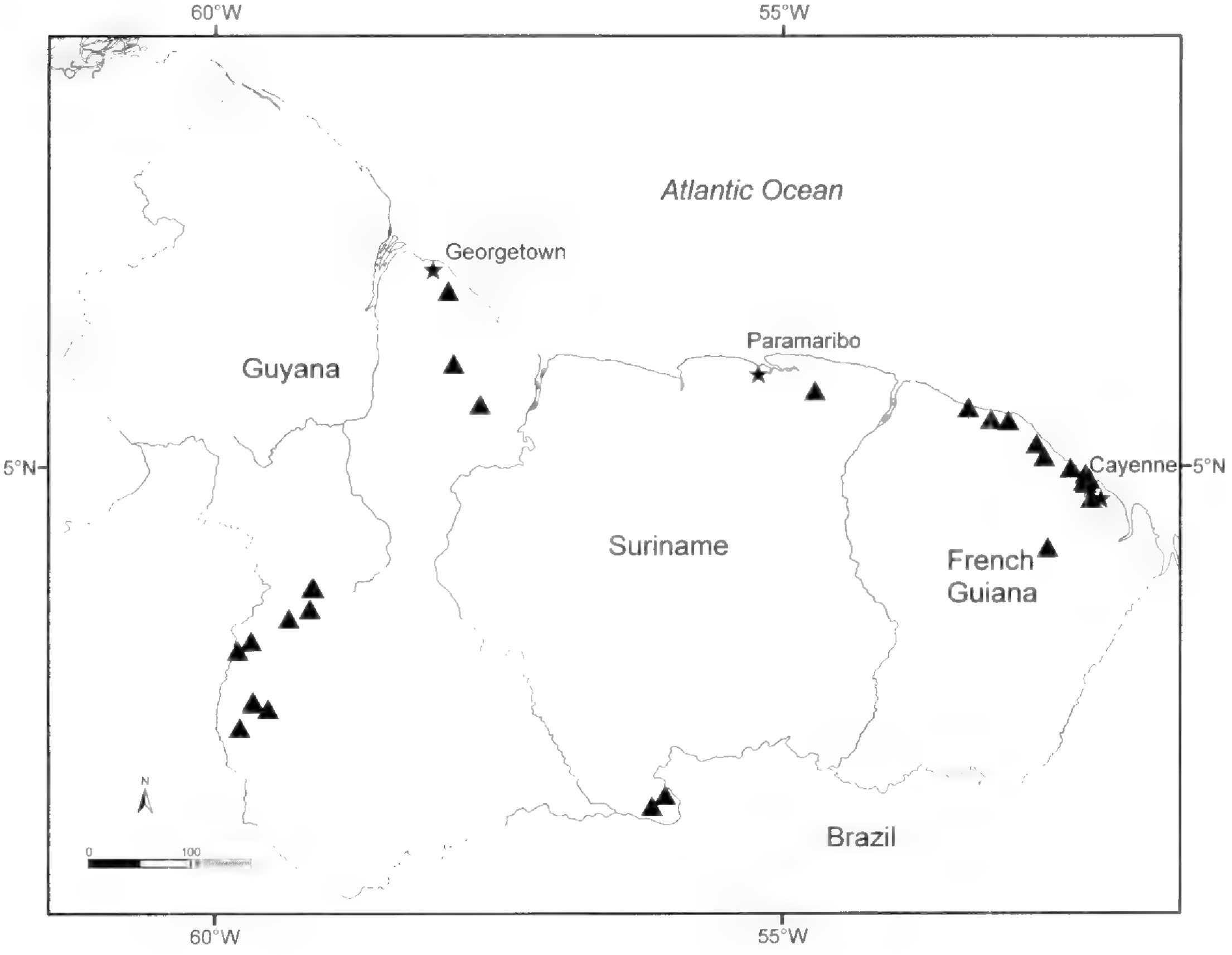

Fig. 27. Distribution of *Rhynchospora hirsuta* in the Guianas.

partitions between veins, sometimes indistinctly so, green, glabrous, margins and midvein beneath antrorsely scabrous, the apex attenuate to triquetrous apex. Inflorescence a terminal and 1 or 2 lateral simple to compound lax corymbose partial panicles from the upper leaf-like bracts; bracts reduced, shorter and narrower than blades, 2-8 cm × 1-4 mm; terminal corymb 4-13 × 3.5-10 cm; branches finely longitudinally ribbed, trigonous to compressed trigonous, smooth to minutely scabrous distally on angles, 1-5 cm long; heads of spikelets 2-20, 7-13 mm in diam.; spikelets numerous, tightly compacted in globose capitula, ovate-elliptic, (2.5-) 3-5 × 1.1-1.8 mm, acuminate at apex, obtuse at base, often longitudinally falcate; scales 5-8 per spikelet, thin, membranous, curvate-keeled, often somewhate longitudinally folded, acute to acuminate at apex, reddish brown or golden brown, lustrous, glabrous, margins erose, midcosta indistinct except at apex, dark brown, extending as smooth to bluntly scabrous short mucro; fertile scales 3-5, ovate to ovate-elliptic, 2.4-4.2 (-4.5) × 1.4-2.5 mm, terminal 1 or 2 scales of spikelet lanceolate-elliptic to linear, these staminate only, the terminal scale often with only 2 stamens; sterile scales 2 or 3 (not including the bract at the base of each spikelet), ovate, 1-2.2 (-2.5) × 0.5-1.4 (-1.5) mm. Stamens 3 or 2 in terminal scale of spikelet, the anthers 1.1-1.8 mm long, apiculate at apex, cuneate at base; style entire or sometimes shortly bi-lobed at apex, long-exserted at anthesis. Achene biconvex, 2-sided, widely obovate to narrowly obovate, 1.4-2 × (0.9-) 1-1.5 (-1.6) mm, rounded at apex, cuneate to base, finely transversely rugulose, often indistinctly so and appearing smooth, shiny, lustrous, brown to dark brown or grayish brown, the margins above middle antrorsely scabrous; epidermal cells isodiametric with low, rounded, central nodules; style base linear-lanceolate, 4-angled, 1.8-3.1 mm long, 0.2-0.4 (-0.6) mm wide at base, antrorsely scabrous on margins, pale brown to reddish brown; bristles 6, filiform, terete in cross section, antrorsely barbed, reddish, to 3 mm long, surpassing achene, shorter than to equaling tip of style base.

Distribution: Mexico, Central America (Guatemala, Honduras, Nicaragua, El Salvador, Costa Rica, and Panama), Bahamas, Greater Antilles (Cuba, Hispaniola, Jamaica, and Puerto Rico), Lesser Antilles, Trinidad, South America (Venezuela, Guyana, Suriname, French Guiana, Brazil, Paraguay, and Uruguay), tropical and southern Africa, Madagascar, and the Mascarene Islands.

Habitat in the Guianas: In a variety of wet or inundated habitats including: depressions in white-sand or sandy clay savanna, grassy places, swamps, edge of creeks or rivers, seepages, seasonal pools or ponds, roadside ditches, agricultural areas, forest edges, openings and clearings in virgin or mixed forest, disturbed forest, and waste places, 0-800 m.

Specimens examined: FRENCH GUIANA: Without locality or date, *J. Martin s.n.* (BM); Cayenne, without date, *J. Martin s.n.* (BM); Cayenne, without date, *H.C. Rothery s.n.* (BM); Cayenne, without date, *von Rohr s.n.* (BM); Cayenne, without date, *J. Martin 322* (BM); Exploitation Matéo, Route de Mana, PK 12, point 26, without date, *A. Leclerc 297* (CAY); Cayenne, 1835, *M. Leprieur s.n.* (G-2); Cayenne, 1840, *M. Leprieur s.n.* (G, P); Without locality, 1854, *Poiret 215* (K); Cayenne, 1857, *P. Sagot s.n.* (BM); Cayenne, 1859, *P. Sagot 1387* (K, P); Without locality, 1867, *H. Jelski s.n.* (US); vicinity of Cayenne, 13 Jun 1921, *W.E. Broadway 487* (K, NY); vicinity of Cayenne, 24 Jun 1921, *W.E. Broadway 575* (NY); vicinity of Cayenne, 4 Jul 1921, *W.E. Broadway 648* (NY); vicinity of Cayenne, Badvenl, 18 Jul 1921, *W.E. Broadway 892* (NY); near Cayenne, 4 Feb 1845, *H.C. Rothery 268* (K); Cayenne, Laboratoire de Botanique, IFAT, 06 Jul 1955, *J.J. Hoock s.n.* (NY, P); Cayenne, Laboratoire de Botanique de l'IFAT, 07 Jul 1955, *J.J. Hoock s.n.* (NY, P, U); Cayenne, route de Rochambeau, Savane Crique Balata, 29 Aug 1955, *J.J. Hoock s.n.* (P); Route de Sinamary, Debut Chemin de Cariacabo, 15 Nov 1955, *J.J. Hoock s.n.* (P); Route de Sinamary Marosi, 1a, 21 Mar 1957, *J.J. Hoock s.n.* (NY, U); Route de Sinamary, Grandes Savanes de Kourou, 03 May 1957, *J.J. Hoock s.n.* (NY); Route de Sinamary Marosi, 1a, *27 Mar 1957, J.J. Hoock s.n.* (U); Route de Kourou du 11e au 14e km, Savane de Tonate, 26 Feb 1968, *C. Sastre & F. Sastre 36* (CAY, NY, P, U); near Crique Gabrielle, tributary right bank lower Mahury River, 04°43'N, 52°17'W, 16 Feb 1970, *A.J.M. Leeuwenberg 11812* (CAY, P); Sud de Cayenne, ancien aérodrome de Gallion entre le pont du tour de l'Ile et le Gallion, 13 Jan 1974, *B. Descoings & Cl. Luu 20116* (CAY, P); Région de Cayenne, route Cayenne-le Gallion, savane à 1 km à l'est du camp militaire du Gallion, 15 Jan 1974,

B. Descoings & Cl. Luu 20238 (CAY); Sur la route Cayenne-Kourou, à 3 km à l'est de Kourou, 18 Jan 1974, *B. Descoings & Cl. Luu 20349* (CAY); Environs de Saint Laurent du Maroni, à 12 km sur la route de Saint Jean, bord de chemin, 20 Jan 1974, *B. Descoings & Cl. Luu 20391* (CAY, P); Ile de Cayenne, R.N.I., Jan 1975, *J.J. de Granville 2332* (CAY); Terrain de l'IRAT, Cabassou, 5 Apr 1976, *Lescure 603* (CAY, P); Savane Changement, 6 km de Sinnamary, 16 Apr 1976, *C. Sastre 4790* (CAY, P); 12 km NW of Kourou, 1 Dec 1976, *D. Roubik 61* (MO); Savane de Corossony, sur la piste de St. Elie; 4 à 7 km à l'WSW de Sinnamary, 29 Dec 1977, *A. Raynal-Roques 19735* (CAY, P); Savane Bordelaise, route du tour de l'Ile, SO. Cayenne, 10 Mar 1977, *G. Cremers & Y. Veyret 4431* (CAY, FTG); Sinnamary, route de Ste. Elie, 23 Jul 1977, *C. Sastre 5545* (CAY, P); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 21 Dec 1977, *G. Cremers 5201* (FTG, P); Savane de Corossony, sur la piste de St. Elie, 4 à 7 km à l'WSW de Sinnamary, 5 Jan 1978, *A. Raynal-Roques 19759* (CAY, P); 11 km SW of Sinnamary, 05°19'N, 52°57'W, 25 Jan 1978, *A.J.M. Leeuwenberg 11646* (CAY, NY, P); Pripris Maillard, grand marais à 4 km au SE de Tonate, 19 Feb 1978, *A. Raynal-Roques 20077* (CAY, P); Marais à env. 2.5 km à l'E de Roura (25 km S de Cayenne), 25 Feb 1978, *A. Raynal-Roques 20114* (CAY, P); Piste de St. Elie (rte en construction longue de 22 km, partant du km 4 de la Rt. Sinnamary-Iracoubo), 10 Mar 1978, *A. Raynal-Roques 20192* (CAY, P); Bord de la piste de St. Elie, km 16, 20 Mar 1979, *M.F. Prevost 456* (CAY, P); Régénération bassin pinus/St. Elie, km12, SW Sinnamary, 9 Feb 1982, *D.Y. Alexandre 5, 6* (CAY); Bord de la piste de St. Elie, km 16.3, 20 Mar 1979, *M.F. Prevost 461* (CAY); Le Gallion (route N2), 18 Oct 1981, *F. Billiet & B. Jadin 1038* (BM, CAY, NY, U); Along St. Elie track, NW of Sinnamary, along trail beyond km marker 23, W

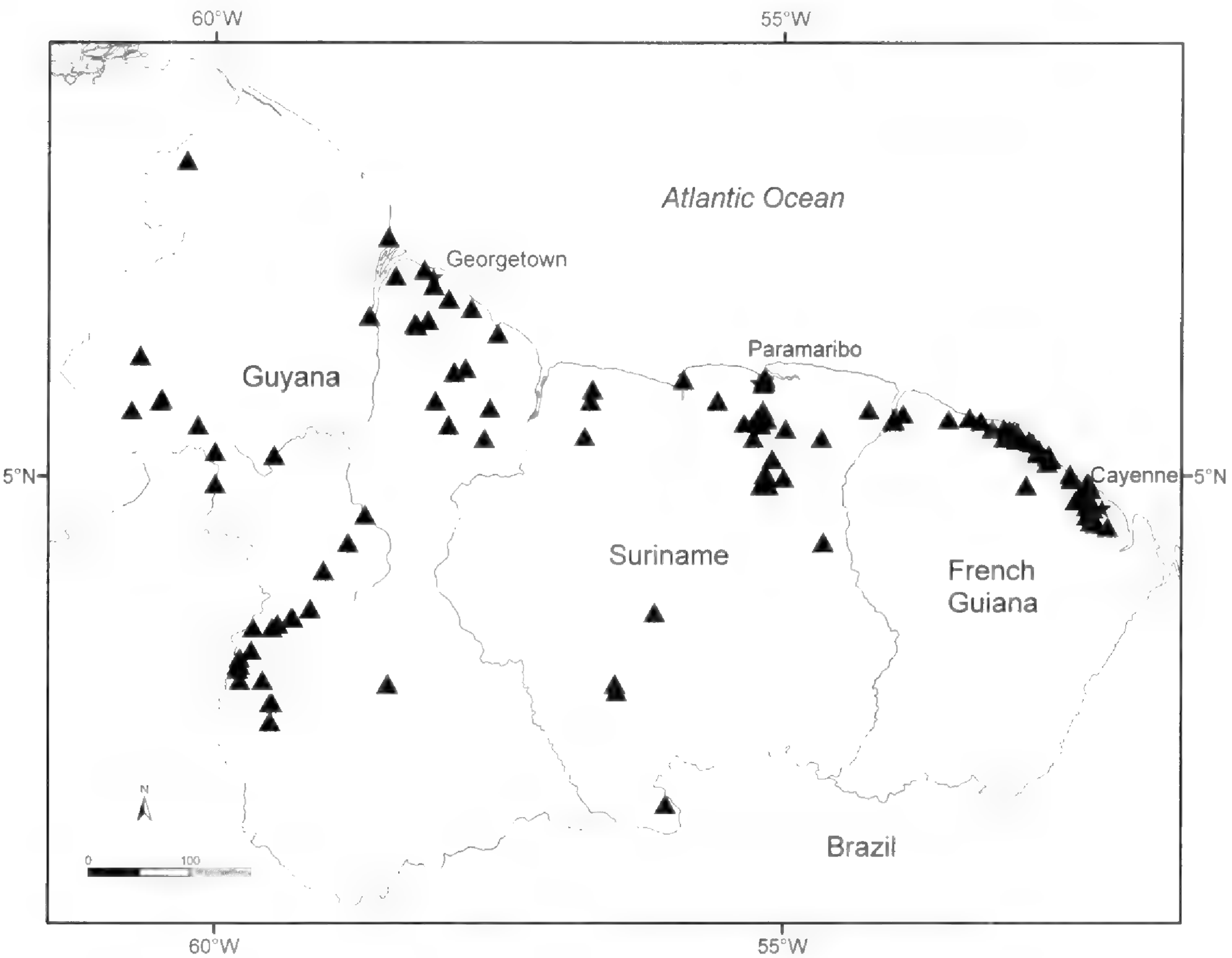

Fig. 28. Distribution of *Rhynchospora holoschoenoides* in the Guianas.

of ORSTOM "Ecerex" project, 200-250 m, 05°20'N, 53°04'W, 6 Jul 1982 *T.B. Croat 53820* (CAY, MO); Dans une dépression du Damaine de Magnan le long de la Comté, Sud Est de Cayenne, Aug 1982, *G.Y. Merlier 49* (CAY); Cayenne, route du Tour de l'Ile, PK 11, 2 Aug 1982, *A. Fournet 234* (CAY, P); Paturage de la Pointe Combi, Environs de St. Elie, 6 Oct 1982, *G.Y. Merlier 96* (CAY, NY, P); Dans un marigot asséché, Champ IRAT de Cayenne, 14 Nov 1982, *G.Y. Merlier 189* (CAY); RN 2, route de l'Est, 14 Jun 1983, *G. Cremers 8124* (CAY, NY, P); St Laurent, piste de Paul Isnard, 9 May 1985, *C. Feuillet 2215* (B, CAY, NY, U); Route du Tour de l'Ile de Cayenne, 28 Mar 1986, *G. Cremers 9383* (B, BRG, CAY, MO, NY, P, U); Montagne de Kaw, 04°33'N, 52°09'W, 25 Dec 1986, *C. Feuillet 3982* (B, CAY, MO, NY, P, U, US); Route de Baduel, Ile de Cayenne, Près de Trou Biran, 10 m, 04°56'N, 52°19'W, 9 May 1987, *M. Hoff 5121* (CAY, NY, P); Along main road through Montagnes de Kaw, at end of road, 04°35'N, 52°15'W, 140 m, 13 Sep 1987, *A. Weitzman & W. Hahn 310* (B, CAY, NY, US). Piste de St. Elie, CD-21, km 15.7, 05°25'N, 53°10'W, 100 m, 15 Sep 1987, *W. Hahn 3712* (B, CAY, F, NY, P, U, US); Commune de Sinnamary, Bassin du Sinnamary, 10 m, 05°23'N, 52°57'W, 5 Feb 1988, *M. Philippe 51* (CAY); Savane de Corossony, Piste de Saint-Elie, 10 m, 05°23'N, 53°00'W, 8 Feb 1988, *M. Philippe 69* (CAY); Commune de Sinnamary, Bassin du Sinnamary, 10 m, 05°23'N, 52°57'W, 5 Feb 1988, *M. Philippe 50* (CAY); about 15 km S of Cayenne on N2 Hwy, 04°48'N, 52°23'W, 2 Jul 1988, *R.M. Harley & C. Feuillet 24797* (CAY, K); Savane Macrabo, Région de Cayenne, 20 m, 04°47'N, 52°22'W, 8 Dec 1988, *M. Hoff 5451* (CAY, NY, P); Savane Aubanèle, Bassin du Kourou, SSW Kourou, 20 m, 05°07'N, 52°41'W, 9 Jun 1989, *G. Cremers & M. Hoff 10728* (CAY); Bois Diable, C.S.G., Région littorale, 6 m, 05°11'N, 52°40'W, 11 Dec 1989, *M. Hoff 6123* (CAY); Savane Macoua, Rêgion littorale, Le long d'une piste allant de la R.N.1 vers la mer, 10 m, 05°29'N, 53°33'W, 26 May 1989, *M. Hoff & G. Cremers 5682* (CAY, NY, P); Savane Mamaribo, R.N. 1, Région littorale, 1 km à l'Est, sur la R.N. 1, 10 m, 05°31'N, 53°22'W, 26 May 1989, *M. Hoff & G. Cremers 5600* (CAY); Dois Diable, C.S.G., Région littorale, 5 m, 05°10'30"N, 52°40'30"W, 29 Nov 1989, *G. Cremers 11081* (CAY, NY, P, U); Savane Mathieu, Iracoubo, Région littorale, 5 m, 05°29'N, 53°16'W, 15 Jan 1990, *M. Hoff 6176* (CAY, NY); Savane Mathieu, Iracoubo, Région littorale, 5 m, 05°29'N, 53°16'W, 15 Jan 1990, *M. Hoff 6185* (CAY); Digue Yiyi, Région Littorale, 2 m, 05°25'N, 53°04'W, 26 May 1992, *D. Toriola-Marbot & M. Hoff 103* (CAY, GENT); Piste de Saint-Elie, 05.5°20'N, 53.5° 00'W 27, Mar 1994, *S. Albertini 9* (CAY); Savane Malmanoury 2, 05°17'24"N, 52°48'42"W, 14 Feb 1995, *L. Cadamuro & Solacroup CS253* (CAY); Savane Diamant, 05°14'15"N, 52°45'34"W, 3 Feb 1995, *L. Cadamuro & Solacroup CS100* (CAY); Savane Dégonde, 05°18'26"N, 52°50'40"W, 5 Feb 1995, *L. Cadamuro & Solacroup CS141* (CAY); Kaw Mountains, Trésor, Favard Creek, 7 m, 04°36'N, 52°18'W, 10 Feb 1996, *M.J. Jansen-Jacobs et al. 5253* (CAY, P, U); Savane de Corossony, Piste de Saint-Elie, 27 Dec 1996, *C. Feuillet 4048* (B, CAY, NY, P, U, US). GUYANA: Without locality or date, *Herbarium 106* (K); Berbice (New Amsterdam), 1837 (1838 on one G sheet), *R. Schomburgk 237* (BM, G, K, P); Without locality, 1838, *R. Schomburgk 239* (G); Without locality, ca. 1867, (herb. Hook.), *W. Parker 1867* (K); Ituribisci Lake, Apr 1886, *G.S. Jenman 2257* (BM, BRG, K, NY, U); Lama Savanna, 0633'N, 57°57'W, Apr 1891, *G.S. Jenman 6137* (K, MO, NY, US); Demerara River, Jun 1894, *G.S. Jenman 6698* (K, NY); Dutch Fort, Canje River, Berbice, Jan 1915, *Herbarium 116* (K); SE of Georgetown, East Coast Water Conservancy, canal SE of Lamaha Stop-off, 27 Nov 1919, *A.S. Hitchcock 16980* (NY, US); Wanama River, 10-23 May 1923, *J.S. de la Cruz 3942* (F, MO, NY, US); Rupununi, 1934, *Herbarium 68* (K); Mazaruni Station, 14 Apr 1937 (KEW Expedition to British Guiana, 1937), *N.Y. Sandwith 1078* (K, U); Mazaruni Station, 27 Jun 1945, *Forestry Department British Guiana M397* (K, U); Mazaruni Station, 27 Jun 1945, *Forestry Department British Guiana 397* (K, P, U); canals near Wales, 10 mi. SW of Georgetown, 0-3 m, 26 Aug 1955, *E.L. Little Jr. 16738* (US); Mahaicony-Abary rice area, E bank Demerara River, about 35 mi. SE of Georgetown, Helicopter stop 19, 0-3 m, 15 Oct 1955, *E.L. Little Jr. 16871* (US); Mahaicony-Abary rice area, E bank Demerara River, about 35 mi. SE of Georgetown, Helicopter stop 26, 0-3 m, 17 Oct 1955, *E.L. Little Jr. 16896* (US); Rupununi District, 10 mi. S of Lethem, 16 Apr 1956, *H.S. Irwin 683* (US); Rupununi District, 10 mi. S of Lethem, 16 Apr 1956, *H.S. Irwin 691* (US); Rupununi District, 4 mi. N of Lethem,17 Apr 1956, *H.S. Irwin 746* (US); Waranama, Berbice

River, Jun 1957, *K.O. Williams 81* (BRG); Ebini Experimental Station, Berbice River, 3 Apr 1958, *S. G. Harrison 725* (BRG, K); Waranama Ranch, Berbice River, 4 Jun 1958, *S.G. Harrison 982* (BRG, K, NY); St. Ignatius, Rupununi, 17 Jul 1958, *S.G. Harrison 1306* (BRG, K, NY); Ireng River, above Orinduk Falls, 2000 ft, 7 Aug 1958, *S.G. Harrison 1396* (BRG, K, NY); Rupununi savanna, near Kanuku Mountains, 14 Feb 1959, *J. Lanjouw et al. 767* (U); Rupununi savanna, near Kanuku Mountains, 16 Feb 1959, *J. Lanjouw et al. 807* (U); Taurakuli, Abary River, 12 Dec 1959, *V. Graham 286* (K); Kukui River, upper Mazaruni River basin, 12 Sep 1960, *S.S. Tillett & C.L. Tillett 45401* (NY, US); Ireng River, between Waipa and Sand Hill Rapids, 19 Sep 1961, *B. Maguire et al. 46230* (K, NY, US); 2 mi S of St. Ignatius, near Takutu, 5 Aug 1963, *R.J.A. Goodland 294* (NY); St. Ignatius, S road Takutu, 8 Aug 1963, *R.J.A. Goodland 326* (NY); Rupununi Northern Savanna, Lake Amucu Yupukarri, 350 ft, 15 Oct 1963, *R.J.A. Goodland 997* (US); North Rupununi, Apr 1968, *D.H. Davis 872* (BRG, K, NY); Soesdyke, Mar 1974, *A. Cooper 88* (U); Soesdyke, Mar 1974, *A. Cooper 88b* (U); Rupununi, 7 Nov, *C.D.K. Cook 132* (K, NY); road to St. Cuthbert's Savannah, ca 10 km in from Linden-Soesdyke highway, ca. 50 km S of Georgetown, 8 Aug 1976, *S.A. Mori et al. 8036* (K, NY); Rupununi District, Manari, 20 Oct 1979, *P.J.M. Maas et al. 3689* (F, K, MO, NY, U), *3690* (F, K, MO, NY, P, U); Sand Hills, W of Abary River, 4 Oct 1981, *P.J.M. Maas et al. 5506* (F, K, MO, NY, P, U); Jawalla, at confluence of Kukui River and Mazaruni River, 05°40'N, 60°29'W, 500 m, 6 Feb 1985, *J. Renz et al. 14129* (U); Canje River, ± 0.75 km N of Ekwarun River, 05°20'N, 57°38'W, 0-25 m, 10 Apr 1987, *J.J. Pipoly et al. 11404* (B, MO, NY, U, US); Canje River, Cow Savanna, E of Digitima Creek, 05°36'N, 57°35'W, 1-25 m, 12 Apr 1987, *J.J. Pipoly et al. 11443* (B, F, NY, U, US); Canje River, ± 1 km N & S of Digitima creek, ± 0.5 km W of river, 05°36'N, 57°35'W, 0-20 m, 15 Apr 1987, *J.J. Pipoly et al. 11615* (CAY, US); Kaieteur Falls, between the falls and Kaieteur summit, 05°11'N, 59°29'W, 550 m, 7 Oct 1987, *L.P. Kvist et al. 116* (B, BM, P, U, US); Mabura Hill, 180 km SSE of Georgetown, near township of Mabura, 0-50 m, 05°20'N, 54°40'W, 18 Mar 1988, *H. ter Steege et al 298* (U); Mabura Hill, 180 km SSE of Georgetown, 0-50 m, 05°20'N, 54°40'W, 24 Jul 1988, *H. ter Steege et al. 427* (NY, U); Mabura Hill, 180 km SSE of Georgetown, 0-50 m, 05°20'N, 54°40'W, 6 Sep 1988, *H. ter Steege et al. 525* (NY, U); vicinity of Karanambo, 26 Sep 1988, *P.J.M. Maas et al. 7694* (NY, U); South Rupununi savanna, Dadanawa, 02°50'N, 59°31'W, 100-120 m, 17 Jun 1989, *L.J. Gillespie et al. 1640* (MO, NY, U, US); Sand Creek Village, 3 km E of junction of Rupununi & Katawau Rivers, 1 km S of village, 03°00'N, 59°31'W, 100 m, 21 Jun 1989, *L.J. Gillespie et al. 1702* (US); Sand track to St. Cuthbert's Mission, ± 4 mi. E of highway, 06°19'N, 58°14'W, 40 m, 22 Jan 1990, *T. McDowell et al. 1772* (NY, US); along road leading N from Karanambo between compound and dam-pond, 03°45'N, 59°19'W, 105 m, 18 Feb 1990, *T. McDowell et al. 1867* (NY, US); Essequibo River at Karupukari crossing, 0.5 km W of W landing along road to Iwokrama, 04°39'36"N, 58°41'03"W, 60-75 m, 19 Apr 1992, *B. Hoffman et al. 1330* (NY, U, US); Pakaraima Mountains, along small creek 0.5 km W from schoolhouse, Chinowieng Village, 05°27'N, 60°09'W, 700-800 m, 20 Oct 1992, *T.W. Henkel 15* (US); Iwokrama Rainforest Reserve, 1 km N of Surama, 200 m, 20 May 1995, *C. Ehringhaus 113* (US); Rupununi Northern Savanna, Along Pirara River at bridge just north of Pirara Ranch, 03°40'N, 59°40'W, 80 m, 19 Oct 1996, *C.N. Horn & J. Wiersema 11003* (US); Rupununi Northern Savanna, 0.5 mi. W of Turtle Pond, 8 mi. N of Karanambo, 1 mi. S of Benoni River, 03°50'N, 59°10'W, 80 m, 23 Oct 1996, *C.N. Horn & J. Wiersema 11085* (US); Iwokrama Rain Forest Reserve, Karupukari, 20 mi. SW on Karupukari/Annai Road, near camp, 04°25'N, 58°50'W, 60 m, 19 Mar 1997, *S.A. Mori et al. 24479* (US). SURINAME or GUYANA: 1854 (1843 on G sheet), *F.W.R. Hostmann 1193* (BM, G-2,K, MO, P, U). SURINAME: Paramaribo and vicinity, without date, *H.C. Focke 1068* (U); Paramaribo and vicinity, without date, *H.C. Focke 909* (U); Without locality, 1841, *M. Berthoud-Coulon 55* (BM); Zanderij I, 5 Jul 1912, *J. Kuyper 77* (U); Forest of Zandery, 31 May 1916, *J.A. Samuels 485* (K, NY, P); Kleisavanne, Piai Kreek and savanna, 13 Sep 1920, *A.A. Pulle 561* (U); Zanderij I, 22 Jul 1933, *J. Lanjouw 138* (K, NY, U); Zanderij I, 29 Jul 1933, *J. Lanjouw 297* (U); Near Brownsweg, 13 Nov 1933, *J. Lanjouw 1263* (K, U), *1266* (MO, U); Zanderij II, 25 Jan 1942, *G. Stahel s.n.* (U); along Saramacca Rivier, 2 Jun 1944, *B. Maguire & G. Stahel 23600a* (NY); Zanderij II, Sectie O, km 70, along railroad, 3 Jun 1944, *B. Maguire & G. Stahel 23648* (NY, U, US);

Zanderij II, 19 Oct 1944, *B. Maguire & G. Stahel 25029* (F, K, NY, U, US); Onverwacht, swamp, 14 Apr 1948, *D.G. Geyskes s.n.* (U); Zanderij I, 4 Sep 1948, *J. Lanjouw & J.C. Lindeman 116b* (U); Zanderij I, near the airport, 9 Sep 1948, *J. Lanjouw & J.C. Lindeman 232* (K, NY, U); Moengo tapoe ad Grote Zwiebelzwamp, 11 Oct 1948, *J. Lanjouw & J.C. Lindeman 765* (U); Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp, 21 Oct 1948, *J. Lanjouw & J.C. Lindeman 932* (K, NY, U); along rail road near km. 106 (Langs spoorlijn bij km 106) [between km 72 and Kabelstation], 22 Apr 1949, *J. Lanjouw & J.C. Lindeman 3031* (K, NY, U); Zanderij, 22 Dec 1950, *J. Florschütz & P.A. Florschütz 795* (C, NY, U); First clay savanna on E bank of Marataka Rivier, 8 Apr 1951, *J. Florschütz & P.A. Florschütz 1998* (C, NY, U); Zanderij I, 19 Mar 1951, *D.G. Geyskes 86* (U); Laag bos in de buurt van Matta savanna, 28 Jul 1952, *Ir J.G.P. Dirven LP262* (U); Rijstsawah, 21 Oct 1952, *Landbouwproefstation LP363* (U); Vier Kinderen, 31 May 1956, *P.C. Heyligers 87* (U); Prope Jodensavanne (fluv. Suriname), 21 Jun 1957, *P.C. Heyligers 842* (U); Para tegenover Hannover, Aug 1958, *J. van Donselaar 398* (U); Republiek, 18 Apr 1960, *P.H. van Doesburg Jr. 69* (U); vicinity of Paramaribo, 23 Nov 1960, *K.U. Kramer & W.H.A. Hekking 2141* (U); Road from Berg en Dal to Afobaka road, S side of Blauwe Berg, 20 Dec 1962, *J.G. Wessels Boer 408* (U); Brownsweg, by railroad km 116, 14 Feb 1963, *J.G. Wessels Boer 674* (U); Saramacca Canal, en de wef Paramaribo-Uitkijk, 1 Mar 1963, *T.W. Reijenga 187* (U); Kappel Savanne near the S foot of the Tafelberg, 9 Jun 1963, *J.G. Wessels Boer 1527* (U); Kayserberg Vliegveld (Zuid Rivier), 12 Aug 1963, *J.P. Schulz 10381* (U); Zuid Rivier, Kayser airstrip, 45 km above confluence with Lucie Rivier, 270 m, 26 Sep 1963, *H.S. Irwin et al. 57627* (US); Kayser airstrip, Zuid Rivier, ca. 45 km above confluence with Lucie Rivier, 270 m, 03°10'N, 58°29'W, 27 Sep 1963, *H.S. Irwin et al. 57673* (NY, U, US); Kayser Airstrip, Zuid Rivier, 45 km above confluence with Lucie Rivier, Wilhelmina Gebergte, 270 m, 27 Sep 1963, *H.S. Irwin et al. 57673* (NY, U, US).Kayser Airstrip, Zuid Rivier, 45 km above confluence with Lucie Rivier, Wilhelmina Gebergte, 270 m, 27 Sep 1963, *H.S. Irwin et al. 57673* (NY, U, US); Maratakka River, on W bank Saparra Kreek [W-oever van Mara bij Surarwa Kreek (locality on U sheet)], 8 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3205* (F, U, US); 10 km nearby Lapara Kreek, boven Maratakka Rivier, 11 May 1965, *P.J.M. Maas & J.A. Tawjoeran LBB10758* (U); Lely Mountains, SW plateaus covered with ferrobauxite, 550-710 m, 3 Oct 1966, *J.C. Lindeman et al. 653* (NY, U); Brownsberg, by small artificial lake made by golddiggers, 22 Sep 1967, *J.C. Lindeman LBB12103* (U); Sipaliwini Savanne area on Brazilian frontier, 20 Nov 1968, *F.H.F. Oldenburger et al. 556* (U); Sipaliwini Savanne area on Brazilian frontier, 24 Jan 1969, *F.H.F. Oldenburger et al. 969* (NY, U); Sipaliwini Savanne area on Brazilian frontier, on airstrip, Feb 1970, *F.H.F. Oldenburger et al. 1329* (K, NY, U); Para Savanne, zuid van Hannover, 4 Apr 1971, *P.A. Teunissen LBB12974* (U); Fransina Savanne, 05 Sep 1973, *M. Teunissen & P. Teunissen LBB13173* (U); Afobaka, N bank of Lake Prof. Dr. Ir. W.J. van Blommesteinmeer, ca. 100 km S of Paramaribo, 10 Aug 1974, *A. Lasseigne 4418* (MO-2, NY); Lely Mountains, SW plateaus covered by ferrobauxite, 550-710 m, 1 Oct 1975, *J.C. Lindeman et al. 653* (K); Zanderij, sandy pit near LBB, 5 Mar 1976, *R. Jansma LBB15546* (U); Brownsberg Nature Preserve, 450-500 m, 24-25 Sep 1979, *W.W. Thomas 2353* (NY); Brownsberg Nature Preserve, 450 500 m, 24-25 Sep 1979, *W.W. Thomas 2363* (NY); Experimental farm Kabo, 11 Aug 1981, *A.P. Everaarts 389* (U); Experimental farm Kabo, 11 Nov 1981, *A.P. Everaarts 566* (U); Experimental farm Coebiti, 22 Jun 1982, *A.P. Everaarts 666* (U); Experimental farm Kabo, 29 Dec 1982, *A.P. Everaarts 738* (U); Experimental farm Kabo, 30 Dec 1982, *A.P. Everaarts 745* (U); Experimental farm Kabo, 21 Jun 1984, *A.P. Everaarts 983* (U); Zandery, near J. Starke Opleidingscentrum, 3 Apr 1986, *H. Viane 1154* (MO).

41. Rhynchospora immensa Kük., Bot. Jahrb. Syst. 56, Beibl. 125: 17. 1921. *Rhynchospora aristata* var. *immensa* (Kük.) Kük., Bot. Jahrb. Syst. 74: 401. 1949. LECTOTYPE: Brazil; Amazonas, *Ule 8541* (B, photo US ex B; isolectotype: US!), designated by Kükenthal, Bot. Jahrb. Syst. 74: 401. 1949. Figs. 26, 65A-D.

Robust, rhizomatous perennial, 115-220 cm tall; rhizome short, stout, hardened; roots 1-2 mm thick; sheathing base of culm 1-3 cm wide. Culms ascending, 3.8-8 mm wide, narrowing to 2 mm

distally, triquetrous, stiff and hardened, finely ribbed, smooth, green to pale green distally, often golden brown proximally, glabrous or sometimes sparsely pubescent at nodes. Leaves 9-15, ascending, spreading at base, subdistichous, 40-110 cm long; sheaths eligulate, loose, stiffly herbaceous, finely veined, light brown and semi-glossy abaxially, golden brown and highly glossy adaxially, glabrous, the inner band herbaceous to thinly herbaceous on proximal sheaths with a deeply U-shaped orifice at apex; blades linear-lanceolate, 9-23 mm wide, flattened to subplicate distally, herbaceous to thickly herbaceous, green with the midvein often golden brown, finely and closely veined on both surfaces, often with indistinct cross partitions between veins, essentially glabrous, margins finely antrorsely scabrous, long-acuminate to triquetrous apex. Inflorescence a terminal and series of 3-5, open and very diffuse partial panicles from the upper leaf-like bracts, the teminal panicle 11-23 × 8-28 cm; bracts reduced distally, the lowermost elongate, exceeding their subtending panicles, the distal ones becoming successively shorter and are shorter than to equaling their subtending panicles; primary inflorescence branches 3- to 4-angled or obtusely so, secondary and tertiary ones 4-angled, often finely antrorsely spinulose on margins; spikelets range from 30 (on lowermost panicles) to 140 or more (on terminal panicles), ovoid-lanceoloid, obtuse to cuneate at base, acuminate at apex, 7-9 × (0.9-) 1.1-1.7 mm; scales obtuse to broadly rounded in cross section, herbaceous to subscarious on distal scales of spikelet, finely cellular-striate, light brown to brown, glabrous to very minutely puberulent at apex on distal scales of spikelet, midcosta very fine and thread-like, indistinct proximally, prolonged beyond the obtuse to acute apex as an antrorsely scabrous awn on proximal scales, shorter or merely a mucro on distal scales of spikelet; fertile scales 3-7, inrolled, ovate-lanceolate, 4.7-6.5 × 2.7-3.7 mm; sterile scales 3-6, ovate to ovate-elliptic, 1.5-4 × 0.8-3.4 mm. Stamens 3, 2.5-3 mm long, triangular-apiculate at apex, truncate and finely papillate or lobed at base; style entire to shortly bifid, equaling to shortly exceeding subtending scale. Achene biconvex, subrounded-obovate or widely oblong-obovate, 1.5-1.8 × 1-1.3 mm, cellular-cancellate, broadly rounded to subtruncate at apex, abruptly contracted at base to short stipe, with 15-19 vertical rows of horizontally oriented rectangular cells, pale brown to brown; epidermal cells rectangular, horizontally oriented; style base triangular-lanceolate, 1.7-2.5 mm long, 0.6-0.8 mm wide at base, flattened, thin and brittle, brown; bristles 2-4, several often rudimentary, needle-like, overtopping achene, shorter than to equaling tip of style base, antrorsely barbed, reddish.

Distribution: Central America (Guatemala, Costa Rica, and Panama) and South America (Colombia, Venezuela, Guyana, Trinidad, and Brazil).

Habitat in the Guianas: Occurs at higher elevations (1500-2000 m) in the Pakaraima mountains of Guyana. Throughout its range, this species generally occurs in montane habitats at high elevations.

Specimens examined: GUYANA: ± 2-5 km NW of northern "prow" of Roraima, 05°17'N, 60°44'W, 1500-2000 m, 24 Feb 1989, *W. Hahn & D. Gopaul 5487* (US); Pakaraima Mountains, Mt. Wokomung, summit plateau, from central plateau, 1-2 km N to escarpment, 05°04'N, 59°52'W, 1500-1530 m, 19 Feb 1993, *T.W. Henkel et al. 1492* (US); Mt. Wokomung, Little Ayanganna, summit of highest point of Mt. Wokomung massif, 05°04'53.1"N, 59°50'26.1"W, 1660 m, 6 Jul 2003, *H.D. Clarke et al. 10624* (US).

42. Rhynchospora junciformis (Kunth) Boeck., Linnaea 37: 557. 1873. *Dichromena junciformis* Kunth, Enum. Pl. 2: 279. 1837. TYPE: French Guiana, *Poiteau 110* (holotype: P; isotypes: C, K!). Figs. 29, 84C-D.

[*Spermodon edentulus* Nees, Linnaea 9: 296. 1834, *nom. nud. Rhynchospora edentula* (Nees) H. Pfeiff., Repert. Sp. Nov. Regni Veg. 23: 345, t. 38, f. 1. 1927, *nom. invalid.*].

Rhynchospora junciformis var. *monocarpa* Kük., Bot. Jahrb. Syst. 56 (Beibl. 125): 19. 1921. TYPE: Guyana; Hylaea-Rio Branco, Surumu, Auf Felsen der Serra de Mairary, 1200 m, *Ule 8370* (holotype: B, destroyed).

Caespitose annual, 6-13 (-15) cm tall; roots fibrous, pale brown. Culms ascending, 0.3-0.6 mm wide, compressed-trigonous or subterete, firm, finely ribbed, very minutely and obscurely papillate, pale green, glabrous. Leaves 3-5, ascending, basal and cauline, 3.5-14.5 cm long; sheaths short, ligule represented only by a thickened band of tissue at adaxial junction of sheath and blade, herbaceous, finely veined, pale

brown, dark green to brown at base, glabrous, the inner band membranous, pale brown to brown, splitting with age, with truncate to slightly concave closed orifice; blades filiform, 0.2-0.5 mm wide, involute, crescentiform-capillary to terete, herbaceous, finely veined, greenish or pale brown, glabrous, margins antrorsely scabrous only at apex, the apex acuminate. Inflorescence consisting of a terminal and 1 or 2 lateral, small corymbose partial panicles from the upper leaf-like bracts; bracts linear-lanceolate to linear-setaceous, antrorsely scabrous on margins, the lowermost of a corymb exceeding subtending corymb; partial panicles 9-22 (-25) × 10-26 (-35) mm; corymb branches compressed-trigonous or subterete; spikelets 10-30 per corymb, ovoid-lanceoloid, acuminate at apex, cuneate at base, (3.8-) 4-5 × 0.7-1.1 mm, light brown, the scales spreading with maturing achenes; scales 6-9 per spikelet, broadly obtuse to rounded dorsally, lower sterile and fertile ones subcoriaceous, pale green or light brownish, smooth, glabrous, upper fertile scales herbaceous, reddish brown, lower fertile scales with broad scarious, red-lineolate margins, midcosta indistinct except at apex, there prolonged beyond the acute to acuminate apex as a thickened antrorsely scabrous awn; fertile scales 4-6 per spikelet, each subtending a bisexual flower except for the terminal one which is functionally staminate, ovate-elliptic to ovate-lanceolate, 2-3.1 (-3.5) × 1-1.8 mm; sterile scales 2 or 3 at base, smaller than fertile ones, ovate to ovate-elliptic, 1-2 (-2.3) × 0.7-1.3 (-1.5) mm. Stamens 2, the anthers 0.7-1.1 mm long, apiculate at apex, truncate with minute colorless papillae at base; style 2-branched, ⅓ to ½ length of unbranched portion. Achene biconvex, rounded to oblate, (0.7-) 0.8-1 mm long and as wide, with short narrow, 0.1-0.3 mm long stipe at base, rounded at apex, transversely rugose, light yellowish brown or light bluish gray, often with a longitudinal dark gray band or patch medially on each side; epidermal cells linear, vertically oriented; style base triangular, 0.2-0.3 mm long, 0.1-0.2 mm wide at base, granular, light brown to dark brown; bristles absent.

Distribution: South America (Venezuela, Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: Moist to wet depressions or swampy areas in sand savanna, 0-50 m.

Specimens examined: FRENCH GUIANA: Without locality, Jul 1824, *M. Poiteau 110* (C, K, P). GUYANA: Manari, 03°28'N, 59°41'W, 20 Oct 1979, *P.J.M. Maas & L.Y.Th. Westra 3684* (F, K, MO, NY, P, U), *3743* (U), *3765* (K, NY, U). SURINAME: Wilhelmina Gebergte, Zuid Rivier, bordering Kayser airstrip, ca. 25 km above confluence with Lucie Rivier, 270 m, 03°2000N, 56°2900W, 2 Jul 1963, *B. Maguire et al. 53969* (NY); Upper-Sipaliwini area, 02°00'N, 59°09'W, 4 Sep 1966, *J. van Donselaar 3668* (U).

43. Rhynchospora longibracteata Boeck., Linnaea 37: 534. 1873. LECTOTYPE: Guyana (British Guiana); Berbice, 1837, *Schomburgk 233* (K!; isolectotypes: fragment B!, BM!, G-2!, P, W!), designated by T. Koyama, Mem. New York Bot. Gard. 23: 53. 1972. Figs. 29, 71C-D.

Caespitose perennial, 45-135 cm tall; rhizome short, to 3 cm thick; roots coarse, 1-2 mm in diam; sheathing base of culm 5.5-14 mm wide. Culm ascending, (1.2-) 1.5-4 mm wide, obtusely trigonous to subterete or subflattened, easily compressed, hollow with septate partitions (at least some present), finely ribbed, green to light green, glabrous. Leaves 3-7, ascending, mostly basal, 1-3 cauline, 12-120 cm long; sheaths eligulate, herbaceous, finely veined, pale brown, glabrous, inner band with a membranous, narrow reddish brown band medially, the orifice convex to truncate with an indentation in the margin of the sheath at its junction with blade (at each corner of the orifice); blades linear-subulate, 1.2-4 mm wide, thickly V-shaped, trigonous distally, easily compressed, spongy-thickened, finely ribbed, green to light green, glabrous, margins antrorsely scabrous, the apex flattened-trigonous, attenuate, often ancipital distally. Inflorescence a single, globose, compact head of tightly congested spikelets at the summit of the culm, 11-15 mm in diam; involucral bracts 3-8, leaf-like, divergent to reflexed at maturity, the lowest 10-43 cm long; spikelets small, numerous, slender, narrowly ovate-lanceolate to narrowly elliptic-lanceolate, acuminate at apex, short-cuneate at base, 3.5-6 × 0.7-1.5 mm; scales 5-8 per spikelet, herbaceous to submembranous, dorsally acute to obtuse, uniformly whitish stramineous to stramineous, glabrous, margins broadly scarious, midcosta slender and inconspicuous, stramineous, prolonged beyond acuminate apex as a short mucro; fertile scales 2 or 3, ovate-lanceolate, 3-5 × 1.2-2.4 mm;

sterile scales 3-5, ovate to ovate-lanceolate, 2-3.4 × 0.7-1.8 mm. Stamens 3, the anthers 1.1-2.5 mm long, minutely apiculate at apex, 2-lobed at base; style entire, about equaling lenghth of fertile scale. Achenes biconvex, elliptic, 1.8-2.6 × 0.8-1.2 mm, subobtusely acute at base, acute at apex, minutely and faintly rugulose-reticulate, essentially appearing smooth, but minutely papillate under high magnification, light brown to dark brown; epidermal cells rectangular, vertically oriented; style base narrowly triangular to lanceolate, 0.7-2 mm long, 0.2-1 mm wide at base, firm, light brown to brown, longitudinally wrinkled; bristles absent or sometimes bearing 1 or 2 rudimentary bristles at base.

Distribution: Trinidad and South America (Colombia, Venezuela, Guyana, and Brazil).

Habitat in the Guianas: savanna, sandy clay seepages, sedge marsh, and seepages on sandstone, 0-525 m.

Specimens examined: GUYANA: Without locality, 1837, *R. Schomburgk 233* (B, BM, G, K, P, W), *234* (BM); Without locality, 1867, *W. Parker s.n.* (K); Lama Savanna, 0633'N, 57°57'W, Apr 1889, *G.S. Jenman 6139* (K, NY, US); Kamakusa, Upper Mazaruni River, 11-22 Jul 1923, *J.S. de la Cruz 4070* (F, K, MO, NY, US); Mazaruni Station, 27 Jun 1945, *Forestry Department British Guiana M396* (K, U); Mazaruni Station, 27 Jun 1945, *Forestry Department British Guiana 396* (K, P, U); Mahaicony-Abary rice area, E bank Demerara River, about 35 mi. SE of Georgetown, Helicopter stop 34, 0-10 m, 19 Oct 1955, *E.L. Little Jr. 16923* (US); Berbice [New Amsterdam?], Waranama Ranch, Berbice River, 14 Jun 1958, *S.G. Harrison 1120* (BRG, K); St. Cuthbert, St. Francis trail, Demerara, Jun 1970, *D.H. Davis 2031* (BRG, K); Pakaraima Mountains, 0.5-1 km SE of Imbaimadai towards Partang River mouth, 05°42'N, 60°17'W, 525 m, 17 May 1992, *B. Hoffman et al. 1650* (US).

44. Rhynchospora maguireana T. Koyama, Mem. New York Bot. Gard. 23: 54. 1972. TYPE: Venezuela; Amazonas, Río Atabapo, Río Orinoco, 100 m, *Maguire 29270* (holotype: NY!). Figs. 29, 73A-B.

Rhizomatous perennial, 30-80 (-92) cm tall; rhizome short, bulbous; roots medium to coarse, 0.7-1.5 mm wide; sheathing base of culm 6-18 mm wide. Culms ascending, 0.7-2.5 (-2.7) mm wide, trigonous to obtusely trigonous, shallowly channeled along one side, firm, finely ribbed, hirsute to glabrate, with ascending to appressed trichomes, ciliate-scabrous on margins, dark green to green, often faintly mottled with a darker green. Leaves primarily basal, 2 or 3 cauline, somewhat stiffly ascending, 10-32 per culm, 6-40 (-54) cm long, the very base of sheaths on basal leaves light brown, glossy, minutely black or reddish punctate; sheaths eligulate, short, herbaceous to subcoriaceous proximally, finely veined, hirsute to glabrate, with ascending to appressed trichomes abaxially, essentially glabrous adaxially, inner band herbaceous on cauline sheaths (only the orifice membranous), membranous in a narrow medial band on basal sheaths, the orifice concave to truncate on basal sheaths, U-shaped on cauline sheaths; blades narrowly linear, 1.3-4.2 mm wide (flattened), subplicate, substiffened, smooth and glossy adaxially, minutely punctate abaxially, finely veined, dark greyish brown or dark green to greenish brown adaxially, green to reddish or brownish green abaxially, glabrous adaxially, hirsute to glabrate abaxially, margins involute or rarely subflattened, smooth to antrorsely ciliate-scabrous (at least distally), the apex attenuate to flattened or triquetrous tip. Inflorescence a series of 4-13 obconic to hemispherical pedunculate heads of spikelets, borne singly or in pairs from the upper leaf-like bracts, 6-8.5 × 4-8 mm; bracts reduced distally, shorter than to equaling peduncles of inflorescence heads, rarely overtopping them; peduncles trigonous to flattened-trigonous, 1-10 cm × 0.4-0.6 mm, antrorsely scabrous on margins; involucral bracts scale-like, spirally imbricate, 10-20, 1.5-4.5 × 1.3-2.2 mm, tightly surrounding spikelets, subcartilaginous, with hispid to glabrate awns, the awns of the lowermost bracts elongate, often exceeding the inflorescence head; spikelets numerous in each head, laterally compressed to becoming subterete with developing achenes, ovate-lanceolate to lanceolate or lanceolate-elliptic, often curvate, acuminate at apex, narrowly cuneate at base, (3.8-) 4-6 × 0.7-1 mm; scales 5-7 per spikelet, thin, herbaceous, boat-shaped, keeled at anthesis, becoming dorsally obtuse to rounded with developing achenes, lustrous, shiny, iridescent golden brown or yellowish brown on sides below middle, uniformly brown to dark brown distally (above middle), essentially glabrous on sides, hispid on either side of midcosta distally, margins entire, midcosta indistinct proximally, distinct above the middle and densely scabrous-hispid

distally, extending as a short awn beyond the densely scabrous-hispid apex, the apex subacute on proximal scales, acuminate on upper scales; fertile scales 3 or 4, elliptic lanceolate to lanceolate, 3.2-5.5 × 0.8-1.4 mm; sterile scales 2 or 3, ovate-lanceolate to elliptic-lanceolate or lanceolate, 2.2-3.2 × 0.6-1.8 mm. Stamens 3, the anthers 1.8-2 mm long, with triangular-lanceolate appendage at apex and bi-lobed base; style entire, blackish, greatly exserted beyond apex of subtending scale, twisting and coiling. Achenes stoutly biconvex to subrounded, obovoid to elliptic-obovoid, 1.2-2 × 0.8-1.5 mm, transversely rugulose to faintly so, often appearing essentially smooth, often warty on surface near apex, pale brown to brown, rounded at apex, narrowed at base into a short cellular-reticulate stipe, the stipe narrowly 4-ribbed or -angled with uneven sunken sides, darker than achene body, brown to dark brown; epidermal cells linear, vertically oriented; style base discoid or bulbous to conic-subulate, 0.2-0.6 (-1) mm long, 0.3-0.6 mm wide at base, narrower than achene body, spongy-cellular, brown; bristles absent.

Distribution: Endemic to the Guayana shield (Venezuela and Guyana).

Habitat in the Guianas: Wet savanna and granitic outcrops, 200-250 m.

Specimens examined: GUYANA: Rupununi River, watershed between it and Kuyuwini River, Parabaru Savanna, 15-17 Feb 1938, *A.C. Smith 3065* (G, K, MO, NY, US); Kuyuwini Landing, Kuyuwini River, 200 m, 11 Feb 1991. *M.J. Jansen-Jacobs et al. 2552* (U, US); Gunn's Strip savanna, 1 km W of village, 01°40'N, 58°38'W, 250 m, 18 Feb 1994, *T.W. Henkel et al. 4555* (US).

45. Rhynchospora marisculus Nees in Martius, Fl. Bras. 2(1): 142. 1842. *Dichromena marisculus* (Nees) J. F. Macbr., Publ. Field Mus. Nat. Hist. Bot. Ser. 11: 5. 1931.

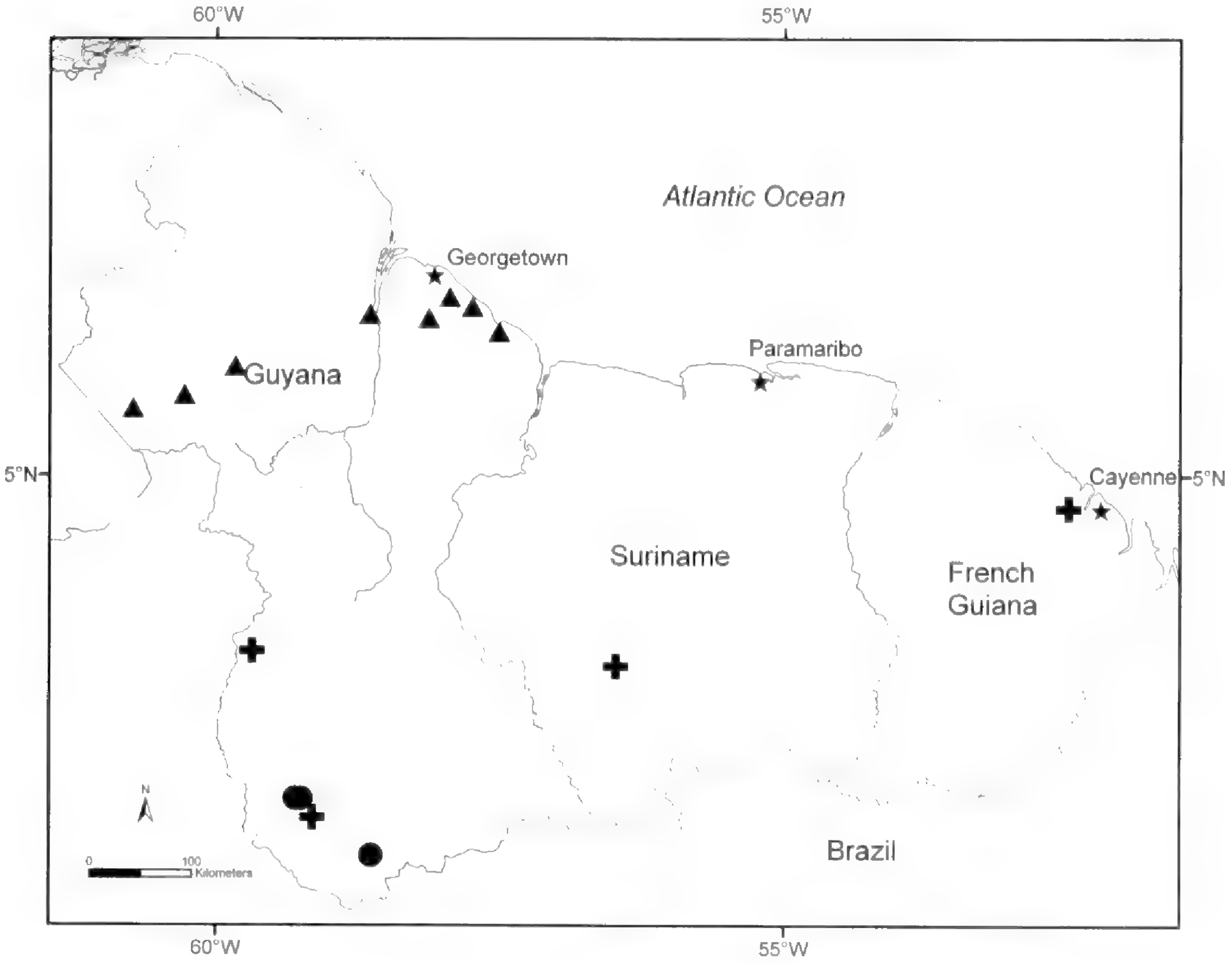

Fig. 29. Distribution of ✚*Rhynchospora junciformis*; ▲*longibracteata*; and ●*R. maguireana* in the Guianas.

LECTOTYPE: Brazil; Sebastianopolis, Rio de Janeiro, *Martius 3193* (M), designated by T. Koyama, Mem. New York Bot. Gard. 23: 56. 1972. Figs. 30, 66C-D.

[*Schoenus marisculus* Lindl. ex Nees in Martius, Fl. Bras. 2(1): 142. 1842, *nom. in syn.*].

[*Rhynchospora rigida* Schrad. ex Nees in Martius, Fl. Bras. 2(1): 142. 1842, *nom. in syn.*].

Rhynchospora tenuiseta C. Wright ex Sauvalle, Anales Acad. Ci. Méd. Habana 8: 83. 1871. TYPE: Cuba, *C. Wright 5870* (holotype: GH).

Rhynchospora marisculus var. *elatior* Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1869(9-13): 149. 1869. TYPE: Brazil; Lagoa Santa, *Warming s.n.* (holotype: C).

Rhynchospora uleana Boeck., Allg. Bot. Z. Syst. 2: 110. 1896. TYPE: Brazil; Santa Catarina, Tubarao, *Ule 1394* (holotype: B, destroyed, photo US ex B).

Rhynchospora weberbaueri C. B. Clarke, Bot. Jahrb. Syst. 37: 518. 1906. TYPE: Peru; Loreto, Berge östlich von Moyobamba, *Weberbauer 4765* (holotype: B, destroyed, photo US ex B).

Rhynchospora borinquensis Britton, Bull. Torrey Bot. Club 42: 387. 1915. TYPE: Puerto Rico; Sierra de Naguabo, Rio Icaco and adjacent hills, open wet places in forest, 465-720 m, 30 Jul to 5 Aug 1914, *Shafer 3515* (holotype: NY!; isotype: US!).

Rhizomatous perennial, 62-170 cm tall; rhizome short, thick, woody; roots medium to somewhat coarse, 0.5-1.5 mm thick; sheathing base of culm 2-8 mm wide. Culms crowded along rhizome, ascending, 1.5-4.5 mm wide, trigonous to obtusely trigonous, stiff, hardened and brittle, asperous with mintute whitish blisters or prickles, finely ribbed, often channeled along one margin distally, pale green, glabrous. Leaves 8-15, ascending, basal and cauline, the lowermost bladeless, 7-90 cm long; sheaths eligulate, short, somewhat stiffened, finely veined, green to pale green, often tinged with brown, glabrous, inner band membranous on basal leaves, tinged with brown, red-dotted, herbaceous on cauline leaves, membranous only distally or at orifice, the orifice concave to truncate on cauline leaves; blades narrowly linear, (1.2-) 1.5-7.5 (-10) mm wide, plicate to subflattened, substiffened, green, semi-glossy adaxially, asperous with minute whitish blisters or prickles abaxially, smooth, finely veined, however indistinctly so adaxially, glabrous, smooth proximally, finely antrorsely serrate-scabrous distally, long-acuminate to triquetrous tip. Inflorescence a terminal and series of 1-4 lateral, strict to slenderly lax, compound corymbose partial panicles with erect to strongly ascending branches from the upper leaf-like bracts; bracts shorter and narrower than leaves; terminal partial panicle 5-17 × 1.5-4 cm, often curving or nodding at maturity, with typically well over 100 spikelets; branches asperous, trigonous to compressed-trigonous or subflattened or crescentiform, flexuous, spikelets in fascicles at branch tips; spikelets narrowly ovoid-ellipsoid to ovoid-lanceoloid, often slightly curvate, acuminate at apex, narrowly cuneate at base, 4.5-6 (-6.5) × 0.8-1.5 mm, the scales spreading with maturing achene; scales 5-10 per spikelet, dorsally obtuse to rounded, thin to submembranous, finely striate, brown or tinged with reddish brown, often with dark brown lineations, glabrous, margins entire, narrowly scarious, midcosta fine, pale reddish brown, extending beyond the acute to acuminate apex as a mucro on distal scales of spikelet and as a short awn on proximal scales of spikelet, fertile scales 2-6, all subtending bisexual flowers, ovate-elliptic to ovate-lanceolate or linear ovate-lanceolate, 3.4-5 × 1.2-2.4 mm, the upper fertile scales reduced, thin, subtranslucent or membranous, yellowish brown, but with bisexual flowers; sterile scales 3 or 4, ovate to ovate-elliptic, (1.1-) 1.7-2.7 × 0.6-1.7 mm. Stamens 3, the anthers 1.5-2.3 mm long, subulate and awl-like at tip, bearing minute crystalline projections, lobed with crystalline projections at base; style 2-branched, the branches from ½ to over ⅔ length of style base, long-exserted beyond apex of subtending scale, reddish. Achene biconvex, sometimes with unequal sides, the abaxial side usually more tumid than the adaxial side, obpyriform, 1.5-2 × 0.8-1.2 mm, subattenuate to base, rounded to subtruncate at apex, transversely rugulose, semi-glossy, yellowish brown, margins and apex of achene body forming a narrow, constricted edge, pale at junction with style base; epidermal cells rectangular, vertically oriented; style base triangular-lanceolate, flattened, 12-1.6 mm long, 0.5-0.7 mm wide at base, brittle, pale brown to brown or sometimes whitish; bristles 6, subulate to compressed-subulate, 3-6 mm long, often 3 times as long as achene body, overtopping achene and style base, finely antrorsely barbed, reddish.

Distribution: Southern Mexico, Central America (Guatemala, Honduras, Nicaragua, El Salvador, Costa Rica, and Panama), Greater Antilles (Cuba, Hispaniola, and Puerto Rico), Lesser Antilles, and South America (Venezuela, Colombia, Guyana, Suriname, Brazil, Ecuador, Paraguay, Uruguay, Argentina).

Habitat in the Guianas: Sand savanna, savanna forest, sand bars, beds or banks of creeks or streams, sedge swamps, and marshy areas, 0-650 m.

Specimens examined: GUYANA: SE of Georgetown, East Coast Water Conservancy, canal SE of Lamaha Stop-off, 27 Nov 1919, *A.S. Hitchcock 16990* (US); canals near Wales, 10 mi. SW of Georgetown, 0-10 m, 26 Aug 1955, *E.L. Little Jr. 16745* (US); Pakaraima Mountains, Imbaimadai, creek 0.5-1.0 km W of settlement, 05°42'N, 60°18'W, 525-575 m, 9 Oct 1992, *B. Hoffman & T. Henkel 2844* (CAY, US); Pakaraima Mountains, Upper Ireng River, 0.5 km section of Tay-Slay-O Creek, 4-8 km upstream of Ireng mouth, 04°50'N, 59°58'W, 650 m, 18 Jan 1993, *T.W. Henkel et al. 860* (US); New Ayanganna airstrip, vicinity of, 05°18'05"N, 59°49'51.8"W, 640 m, 16 Jun 2003, *H.D. Clarke et al. 9924* (US). SURINAME: Zanderij, 28 Aug 1954, *J.C. Lindeman 6552* (U, US); Prope Jodensavanne (fluv. Suriname), 21 Jun 1957, *P.C. Heyligers 851* (U); between Singri Lanti and Matta, Dec 1976, *R. Jansma 46* (U).

46. Rhynchospora montana (Uittien) H. Pfeiff., Repert. Spec. Nov. Regni Veg. 38: 91. 1935. *Dichromena montana* Uittien, Recueil Trav. Bot. Néerl. 22: 334. 1925. TYPE: Suriname; top of the Brownsberg, *Stahel & Gonggrijp 6728* (holotype: U!; isotype: U!). Figs. 30, 75E-F.

Caespitose perennial, 15-40 cm tall; rhizome short; roots fine. Culms ascending to erect, 0.5-1 mm in diam., triquetrous, acute to obtusely angled, firm, green, glabrous proximally, scabrous along margins distally, hispidulous just below inflorescence head; sheathing base of culm 3-5 mm wide. Leaves mostly basal, 4-8 per culm, often 1 or 2 cauline, 2-16 cm long; sheaths eligulate, short, finely veined, sparsely scabrous-hispidulous on veins, pale green, the inner band membranous, with concave entire orifice; blades elliptic-lanceolate, 1-1.5 cm wide, the lowermost reduced, 2-3 cm × 4-6 mm, finely veined, flat, green, scabrous-hispidulous abaxially along major veins, scabrous on margins, acuminate to apex. Inflorescence a congested, obconic to turbinate head of 8-14 spikelets, 6-8 mm in diam.; inflorescence bracts 3-5, leaflike, exceeding inflorescence, the lowermost one largest, 3.5-9 cm × 7-13 mm; spikelets ovoid, acute at apex, obtusely narrowed to subrounded at base, 5-6.5 × 1-1.7 mm; scales 4-9 per spikelet, ovate to oblong-ovate, 3.5-6 × 1.4-2.2 mm, herbaceous, white to creamy white, boat-shaped, keeled, acute at apex, short-mucronate; fertile scales 3-7, midcosta ciliolate-scaberulous, inconspicuous proximally, greenish distally, the sides sparsely reddish brown lineolate; sterile scales 1 or 2 at base, strongly keeled, with a green, ciliolate-scaberulous keel. Stamens 3, the anthers 2-2.5 mm long, with a short subulate apiculus at apex, truncate and minutely papillate at base; style 2-branched, the branches ½ to about as long as the unbranched portion. Achene biconvex, with convex sides, widely obovate, 1-1.2 mm long and wide, broadly rounded at summit, the surface transversely rugulose, stramineous; epidermal cells narrowly elliptic to linear, indistinct, vertically oriented; style base lunate, decurrent on margins and confluent with margins of achene, ca. 0.4 mm long and ca. 1.1-1.2 mm broad at base, dark grey to brown; bristles absent.

Distribution: Endemic to Suriname.

Habitat in the Guianas: Savanna, forest trails, and plateaus, 550-710 m.

Distinguishing features: The short and wide, lanceolate-elliptic basal leaves and involucral bracts of this species distinguish it at once from all other species of *Rhynchospora* in the Guianas.

Specimens examined: SURINAME: Monte Brownsberg, 3 Apr 1925, *G. Stahel & J.W. Gonggrijp 6728* (K, U); Lely Mountains, SW plateaus covered by ferrobauxite, 550-710 m, 5 Oct 1975, *J.C. Lindeman et al. 798* (U); Brownsberg Nature Reserve, Forest trail to Irene, 18 Feb 1977, *J.C. Lindeman & E.A. Mennega 69* (NY, U).

47. Rhynchospora nervosa (Vahl) Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn ser. 3, 1: 143. 1868. *Dichromena nervosa* Vahl, Enum. Pl. 2: 241. 1805. TYPE: South America, *von Rohr s.n.* (holotype: C-Vahl). Figs. 31, 74A-B.

Schoenus tenuifolius Kunth in Humboldt, Bonpland, and Kunth, Nov. Gen. Spec. 1

(quarto ed.): 228. 1816. *Dichromena tenuifolia* (Kunth) Spreng., Syst. Veg. 1: 203. 1824. *Rhynchospora nervosa* var. *tenuifolia* (Kunth) H. Pfeiff., Repert. Spec. Nov. Regni Veg. 38: 92. 1935, non *Rhynchospora tenuifolia* Griseb., Cat. Pl. Cub. 244. 1866. SYNTYPES: Venezuela. Amazonas, near Cumaná, *coll. ign.* (probably at P-HBK); near Mayapures, *Humboldt & Bonpland s.n.* (P-HBK).

Dichromena pilosa Spreng., Syst. Veg. 1: 203. 1824, *nom. illeg.*

Rhynchospora exigua Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn, ser. 5, 5: 238. 1894. TYPE: Brazil; São Paulo, Campo Seco, Franca, *Loefgren & Edwall 2079* (holotype: C, microfiche US ex C).

Dichromena ciliata var. *vahliana* C. B. Clarke in Urban, Symb. Antill. 2: 101. 1900. TYPE: Cuba, *C. Wright 3797* (holotype: probably at K; isotype: GH).

Rhizomatous perennial, 9-42 (-70) cm tall; rhizome horizontally creeping to arch-ascending; roots coarse, brown; sheathing base of culm 1.5-8 mm wide with fibrous remnants of old sheath bases persistent at base of culm, these often singed by frequent fires in savanna habitat. Culms erect or nearly so, 0.5-1.3 mm wide, obtusely trigonous to subterete, finely and coarsely ribbed, antrorsely scabrous to smooth on ribs at apex, pilose to glabrescent, green to pale green. Leaves 6-17, primarily basal, sometimes 1 or 2 lower cauline,

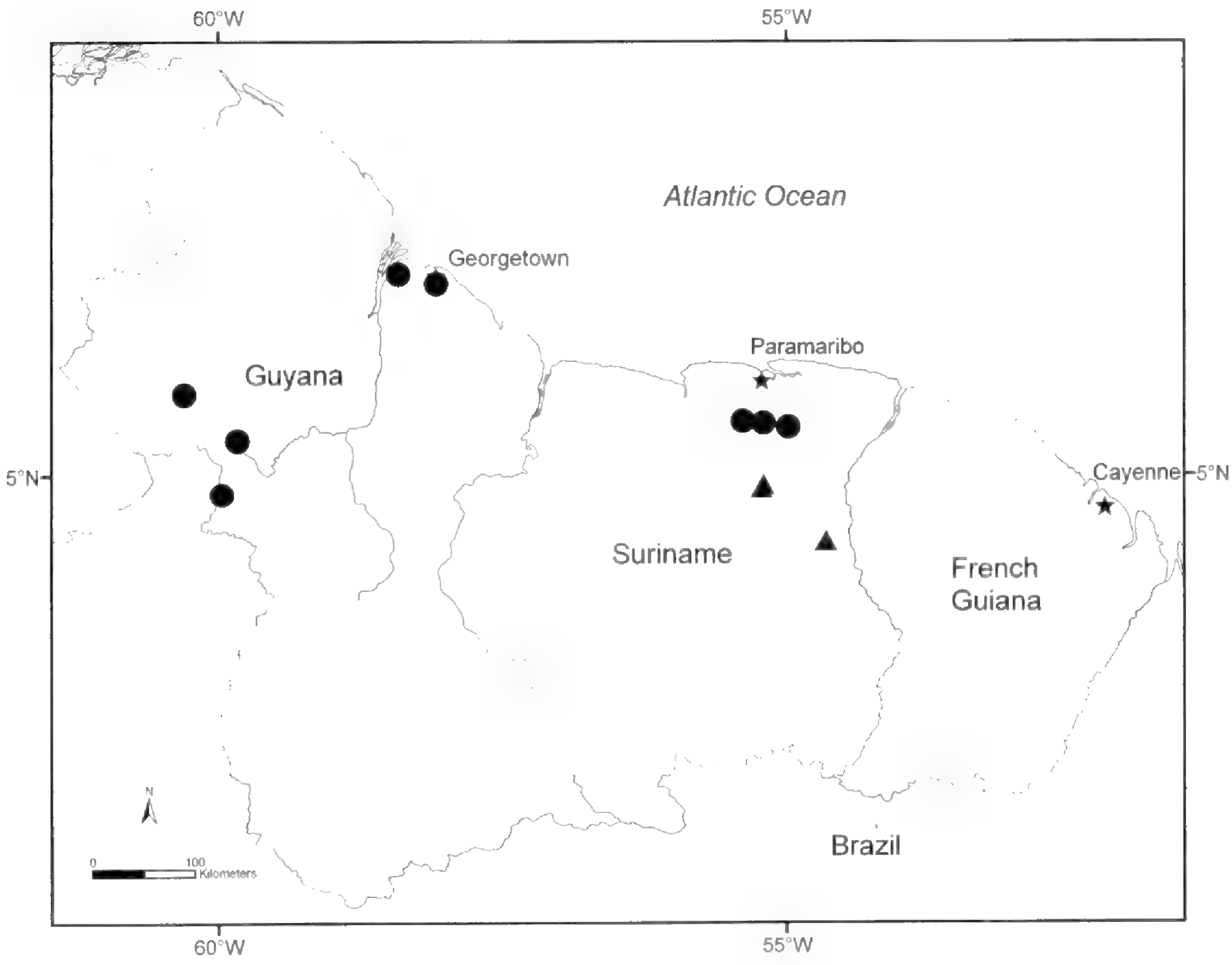

Fig. 30. Distribution of ●*Rhynchospora marisculus* and ▲*R. montana* in the Guianas.

ascending and spreading, 6-42 cm long; sheaths eligulate, herbaceous, finely and very closely veined, pilose to glabrescent, stramineous to pale brown, brown proximally, the inner band membranous, reddish brown, with a concave orifice; blades linear, 1.2-3.5 mm wide, V-shaped proximally to flattened or subplicate distally, herbaceous, finely veined abaxially, cellular-reticulate roughened and semi-glossy adaxially, pilose to glabrescent proximally and glabrous distally on abaxial surface, green, margins pilose-ciliate, antrorsely scabrous distally at the attenuate triquetrous apex. Inflorescence a single obconic or obtriangular head-like corymb of 4-11 spikelets at the summit of the culm, 6-13 mm in diameter, the branches scarcely evident; involucral bracts straight and spreading, the upper shorter ones sometimes divergent to reflexed at maturity, adaxially whitened basally, the lowermost one elongate, 4-15 cm long; spikelets 4.3-7 (-8) × 1.5-2.8 mm, spreading to 4-5 mm with mature achenes ovoid or ovoid-ellipsoid, subrounded at base, acute at apex; scales obtuse to rounded, thinly herbaceous to membranous, subtranslucent, somewhat smooth, uniformly white or whitish stramineous, light reddish lineolate, glabrous, margins entire, midcosta very fine and inconspicuous, greenish distally, not prolonged, ending at the cleft of the emarginate, obtuse to subrounded apex; fertile scales 10-22, ovate to broadly ovate or ovate-lanceolate (upper scales of spikelet), 3.3-5 (-5.5) × 1.8-3.4 mm; sterile scales 1 or wanting, 2.5-3.3 × 1.3-2 mm. Stamens 2 or 3, the anthers 1.7-3 mm long, apiculate at apex, truncate and minutely lobed at base; style 2-branched, the branches $^{2}/_{3}$ to about as long as unbranched portion, about as long as subtending scale or slightly exserted beyond its apex. Achene biconvex, broadly depressed-obovate or rounded-obovate, 1.2-1.7 × 1-1.6 (-1.7) mm, finely transversely rugulose-reticulate, broadly rounded at apex, short-cuneate at base, orangish brown to dark brown at maturity; epidermal cells rectangular, vertically oriented; style base triangular-lunate basally, truncate or obtuse at apex, 0.6-0.7mm long, 1-1.5 mm wide at base, cellular-reticulate, brittle, light brown to dark brown or brown-black at maturity; bristles absent.

Distribution: Mexico, Central America, West Indies (Greater Antilles), Trinidad, South America (Colombia, Venezuela, Guiana, Suriname, French Guiana, Brazil, Ecuador, Peru, Bolivia, Paraguay, and Argentina).

Habitat in the Guianas: Wet depressions in white-sand or sandy clay savanna, and forest margins bordering savanna, 0-750 m.

Distinguishing features: See discussion under *R. ciliata.*

Specimens examined: FRENCH GUIANA: Route de Sinamary, Passoura, Parc a Chenowx, 1 Jun 1957, *J.J. Hoock s.n.* (U); Route Cayenne-Kourou, à 8 km à l'est de Kourou, 28 Jan 1974, *B. Descoings & Cl. Luu 20538* (CAY); Savane Bordelaise, route du tour de l'île, SO. Cayenne, 25 Feb 1977, *Y. Veyret & G. Cremers 4353* (CAY, FTG); Route de Baduel, Ile de Cayenne, Lotissement Dufournier, 10 m, 04°56'N, 52°19'W, 19 May 1987, *M. Hoff 5135* (CAY); Cayenne, 16 Nov 1989, *F. Billet & B. Jadin 4515* (CAY). Digue Yiyi, Région littorale, 2 m, 05°25'N, 53°04'W, 26 May 1992, *D. Toriola-Marbot & M. Hoff 124* (CAY); Savane Fusées Sondes, 05°12'48"N, 52°44'00"W, 20 Feb 1995, *L. Cadamuro & Solacroup CS277* (CAY); Savane incluse "Agami", 05°13'19"N, 52°48'59"W, 8 Mar 1995, *L. Cadamuro & Solacroup CS421* (CAY); Savane Renner, Région littorale, 3 m, 05°20'N, 52°53'W, 18 Apr 1996, *G. Cremers & J.J. de Granville 14426* (CAY). GUYANA: Quimatta, Rupununi River, May 1890, *G.S. Jenman 6207* (K); Baramaticoo savanna, Dec 1907, *Herbarium 94* (K); Berbice, Cattle trail, Waruni-Ituni Savannahs, Feb 1919, *A.A. Abraham 16* (BRG, K); Mt. Roraima, Limao, 21 Sep 1927, *G.H.H. Tate 87* (NY); Waranama Ranch, Wiruni and Ituni savannahs, Berbice River, Sep 1929, *E.B. Martyn 92* (K, NY); Dadanawa, Rupununi River, Rupununi District, Feb 1931, *E.B. Martyn 353* (K); between Takutu River and Kanuku Mountains, 200 m, 12-22 Mar 1938, *A.C. Smith 3339* (B, F, G, K, MO, NY, P, U, US); Sand Creek, Rupununi River, Sep 1948, *Fr. G. Wilson-Browne* (*Forestry Department British Guiana*) *WB127* (K, NY, U); Rupununi savanna, Feb-Mar 1952, *Ir J.G.P. Dirven LP184* (U); Orealla Savannah, Orealla Indian Reservation, Corentyne River, Berbice, 6 Jan 1955, *H.S. Irwin 313* (US); Ebini Savanna, 12 Jan 1955, *K.O. Williams 86* (BRG); Ebini Experimental Station, Berbice River, 1 Apr 1958, *S.G. Harrison 675* (BRG, K); Waranama Ranch, Berbice River, 22 Mar 1958, *S.G. Harrison 584* (BRG, K); St. Ignatius, Rupununi, 16 Jul 1958, *S.G. Harrison 1292* (BRG, K); Orinduik Falls, Ireng River, 2000 ft, 16 Aug 1958, *S.G. Harrison 1465* (BRG, K); St. Ignatius, 31 Jul 1963, *R.J.A. Goodland 241* (NY); Rupununi savanna (northern), Apr 1968, *D.H.*

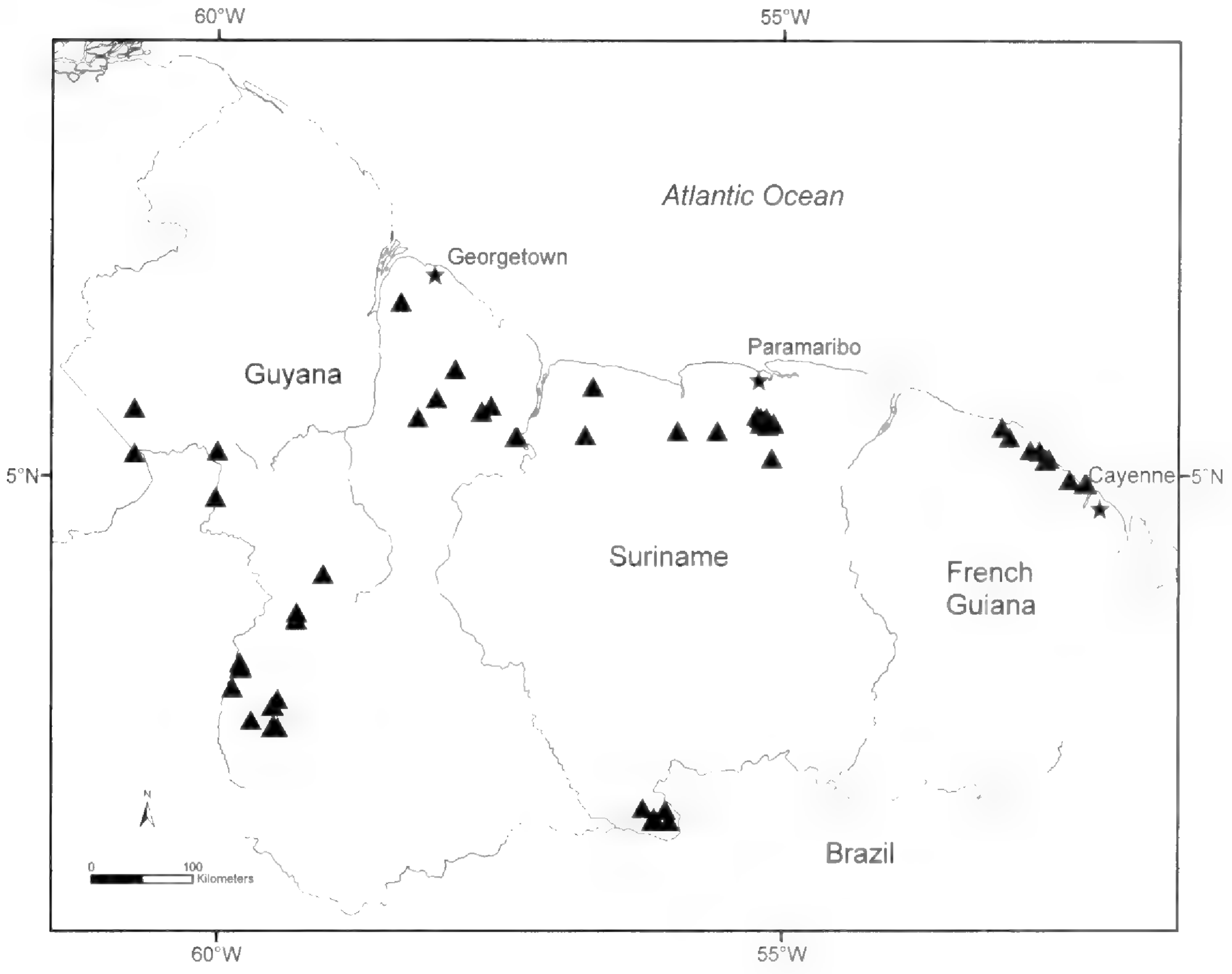

Fig. 31. Distribution of *Rhynchospora nervosa* in the Guianas.

Davis 900 (BRG, K, NY); Lethem, Rupununi savanna, Feb 1974, *A. Cooper 389, 406* (U); Mt. Shiriri 10 mile trail (Kanuku Mountains), 150 m, 30 Apr 1977, *M.S. Grewal et al. 376* (BRG, U); Sand Hills, W of Abary River, 4 Oct 1981, *P.J.M. Maas et al. 5484* (K, NY, U); Kanuku Mountains, Rupununi River, Bush Mouth near Witaru Falls, 90-120 m, 8 Feb 1985, *M.J. Jansen-Jacobs et al. 64* (U, US); Left (S) bank upper Canje River, W of Digitima Creek, 05°36'N, 57°35'W, 0-25 m, 19 Dec 1986, *J.J. Pipoly et al. 9452* (B, CAY, P, U, US); Karanambo, Rupununi River, 2 Sep 1988, *P.J.M. Maas et al. 7192* (B, CAY, F, NY, U, US); Rupununi savanna, Natun Bush Island, ± 2 km SSW of Dadanawa, 02°49'N, 59°28'W, 120-150 m, 18 Jun 1989, *L.J. Gillespie et al. 1694* (U, US); Digitima Savanna, Canje River, ± 20 km S of Mora, 185 km from mouth of Canje, 05°33'N, 57°40'W, 10-20 m, 29 Oct 1989, *L.J. Gillespie et al. 2487* (NY, US); Near Corentyne River and Orealla Amerindian village, 05°20'N, 57°22'W, 20-50 m, 26 Apr 1990, *T. McDowell & D. Gopaul 2511* (NY, US); Aratak Mission, across Kamuni Creek, from Santa Mission, 06°30'N, 58°23'W, 0-200 m, 28 Nov 1992, *A.R.A. Görts-van Rijn et al. 451* (B, MO, P-2, U, US); Pakaraima Mountains, Upper Ireng River; 0.5 km E of Cipo settlement and adjacent savanna ridges, 3-5 km SW, 04°49'N, 60°01'W, 570-750 m, 16 Jan 1993, *T.W. Henkel et al. 810* (US); Dadanawa, Rupununi River, Rupununi District, 120 m, 02°49'N, 59°31'W, 4 Jun 1995, *M.J. Jansen-Jacobs et al. 3890* (US), *3891* (U, US); Iwokrama Rainforest Reserve, Surama, 04°09'N, 59°04'W, 70 m, 5 Apr 1996, *H.D. Clarke 1585* (US); Karanambo, in and near airstrip at Diane McTurk's house, 03°45'08"N, 59°18'23"W, 100 m, 26 Jun 1999, *C.L. Kelloff 1391* (US). SURINAME: 1841, *M. Berthoud-Coulon 48* (MO, NY); Maratakka Rivier, Saparra Savanne, 1 Feb 1915, *J.W. Gonggrijp BW865* (U); Zanderij I, 29 Jul 1920, *A.A. Pulle 89* (K, NY, U, US); Maratakka Rivier, Oct 1922, *J.W. Gonggrijp & G.*

Stahel 865 (U); Boven Sipaliwini, kamp 9, grens, 4 Dec 1935, *H.E. Rombouts 313* (C); Sipaliwini, bronnen, 16 Nov 1935, *H.E. Rombouts 293* (U); Powakka Savanne, Suriname Rivier, 1936!, *J. Frickers & H.J. Muller 15* (U); Vier Kinderen, 5 Sep 1948, *J. Lanjouw & J.C. Lindeman 210* (NY, U); Tibiti Savanne, 5 Jan 1949, *J. Lanjouw & J.C. Lindeman 1591* (K, NY, U); Warra Savanne, W of Maratakka, 7 Apr 1951, *J. Florschütz & P.A. Florschütz 1951* (U); Palaime Savanne, 2 May 1952, *D.C. Geijskes s.n.* (U); Lobin-savanna inter Zanderij I and Hannover, Aug 1958, *J. van Donselaar & W.A.E. van Donselaar 389* (NY); Coesewijne Savanne, 4 Dec 1958, *J. van Donselaar 510* (U); Lobin-savanna inter Zanderij I and Hannover, 22 Jan 1959, *J. van Donselaar & W.A.E. van Donselaar 445* (U); Sipaliwini Airstrip, 40 mi N of Acary Mountains, 11 Dec 1961, *R. Freund & S. Freund 50b* (US); Upper Sipaliwini Rivier, 24 Feb 1963, *J.G. Wessels Boer 741* (U); near village Berg en Dal on top of Blauwe Berg (hill), 30 Jul 1965, *J. van Donselaar 2509* (U); Sipaliwini Savanne area on Brazilian frontier, W border of Great Sipaliwini Savanne, 300 m, 20 Dec 1968, *F.H.F. Oldenburger et al. 639* (U); Sipaliwini Savanne area on Brazilian frontier, Maurisie swamp, 290 m, 4 Jan 1969, *F.H.F. Oldenburger et al. 771* (U); Sipaliwini Savanne area on Brazilian frontier, Feb 1970, *F.H.F. Oldenburger et al. 1348* (U); Para Savane, 04 Apr 1971, *P.A. Teunissen & M. Teunissen 12985* (U); Tibiti Savanne, 20 May 1976, *P.A. Teunissen LBB16110* (U); Tibiti Savanne, 20 May 1976, *P.A. Teunissen 16138* (U); Zanderij Savanne, Feb 1976, *R. Jansma 15654* (U); Republiek, 3 km on road, 6 Oct 1979, *W.W. Thomas 2440* (MO, NY).

48. Rhynchospora nitens (Vahl) A. Gray, Manual, ed. 5. 568. 1867. *Scirpus nitens* Vahl, Enum. Pl. 2: 272. 1805. *Psilocarya nitens* (Vahl) A. W. Wood, Amer. Bot. Fl. 364. 1870. TYPE: United States; "Habitat in Carolina," *Bosc. s.n.* (holotype: C-Vahl). Figs. 32, 79E-F.

Caespitose annual, 4.5-85 cm tall, extremely variable vegetatively in size; roots fine to medium. Culms erect to ascending, 0.5-4.5 mm wide, compressed-trigonous, obtusely 4-angled (rectangular), or subterete, soft, surface appearing roughened under high magnification due to very fine cellular reticulation, finely and coarsely longitudinally ribbed, deeply longitudinally channeled along one side, remotely scabrous along edges of channel, pale green to green, glabrous. Leaves ascending, numerous, basal and cauline, the upper leaf-like bracts subtending inflorescence corymbs, 4-58 cm long; sheaths short, eligulate, herbaceous, inflated, finely veined, green, glabrous, inner band membranous in a longitudinal medial band that expands distally near orifice, upper cauline sheaths herbaceous except for membranous orifice, the orifice truncate to concave; blades narrowly linear, 1-7 (-8) mm wide, flattened proximally, often folded or subinvolute distally, finely veined, midvein indistinct on adaxial side of blade, surface appearing roughened due to very fine cellular reticulation, remotely scabrous to smooth on margins and midvein abaxially, regularly scabrous on margins and midvein distally near apex, green, glabrous. Inflorescence a terminal and series of (1-) 2 or 3 simple to compound corymbs of ascending rays from the upper leaf-like bracts; bracts reduced distally, generally narrower and shorter than leaf blades, usually shorter than subtending corymb except for the lowermost bract which sometimes exceeds it; terminal corymb 0.7-19 × 0.8-15 cm; bracts of corymb branches leaflike, reduced; corymb branches generally same as culm, but narrower in width; spikelets many-flowered, ovoid to oblong-ovoid with acute apex, broadly obtuse to subrounded at base, (3.8-) 4-8 (-9) × (1.8-) 2-2.8 (-3) mm, with only one sterile basal scale above prophyllar bract; fertile scales numerous, thin, somewhat translucent, widely boat-shaped, dorsally acute to obtuse, minutely longitudinally striate, medium brown to reddish brown with very fine dark brown or blackish lineations, glabrous, margins entire, the narrow midcosta pale brown distally and dark brown proximally, often extending beyond the acute apex as a short mucro on proximal scales. Stamens 2, the anthers 0.7-1 mm long, apiculate or with subulate awn-like appendage at apex, beset with crystalline protuberances at base; style 2-branched, the branches about as long as unbranched portion. Achene widely biconvex, obovate to broadly obovate or subrounded, broadly rounded to subtruncate at apex, obtuse to subrounded at base, 1-1.1 × 1 mm, transversely rugose, cellular-reticulate at base, lustrous, yellowish brown to golden brown, maturing to dark reddish brown or brown-black, the rugae often lighter in color; epidermal cells linear, vertically oriented; style

base depressed-triangular, mustache-shaped, indistinctly 2-lobed at base, 0.2-0.6 mm long, about as wide as achene body at its base, crustose, pale brown to subwhitened; bristles none.

Distribution: Southeastern United States, Central America (Honduras and Nicaragua), Greater Antilles (Cuba and Puerto Rico), and northern South America (Guyana).

Habitat in the Guianas: Only a single collection known from a sand bank along the Takutu River, Guyana.

Specimens examined: GUYANA: Takutu River, sand bank, 19 Apr 1960, *V. Graham 392* (K).

49. Rhynchospora papillosa W. W. Thomas, Mem. New York Bot. Gard. 37: 100. 1984. TYPE: Venezuela; Guárico, *Delascio et al. 11342* (holotype: NY; isotype: US!) Figs. 32, 75C-D.

Stoloniferous perennial, 3-14 cm tall; stolons elongate, 0.8-1.5 mm thick; roots fine; sheathing base of culm 3-5 mm wide. Culms ascending, 0.3-1.3 mm wide, flexuous, trigonous proximally, triquetrous with winged angles distally that are broadest just below inflorescence head, finely cellular-reticulate, finely 3-ribbed on each side medially, dark green, glabrous. Leaves numerous, primarily basal, 1 or 2 lower cauline or sometimes one medially on culm, 2-16 cm long; sheaths eligulate, short, inflated distally, thin, dark green, finely and distinctly pale or whitish veined, glabrous, the inner band membranous with a convex to U-shaped orifice; blades 1-4.2 mm wide, linear, flattened, thin, often weak and subflaccid, dark green, distinctly finely 5-13 pale or whitish veined, glabrous or sometimes a few hairs abaxially, abaxial midvein prominent, remotely scabrous towards apex, margins smooth to remotely scabrous distally, the apex attenuate to triquetrous tip. Inflorescence a single head of 3-5, essentially sessile, spikelets at the summit of the culm, 4-9 × 3.5-8 mm; involucral bracts 3-5, generally shorter and narrower than leaf blades, exceeding length of subtending spikelets, the lowermost to 4 cm long, often whitened at very base both adaxially and abaxially; spikelets ovoid to ovoid-ellipsoid, acute at apex, broadly short-cuneate at base, 3.5-5 (-6) × 1.5-2.7 (-3) mm, the scales spreading with maturing achenes; scales 20-40 per spikelet, thin, dorsally subacute to obtuse, becoming dorsally rounded with maturing achenes, obtuse to emarginate at apex, minutely roughened, dull, white to whitish stramineous, glabrous, margins entire, scarious, the midcosta fine, indistinct, green distally; fertile scales ovate to broadly ovate, distal scales of spikelet narrowly ovate, 1.8-2.7 × 1-2 mm; sterile scales wanting except for the persistent 2-nerved, small, ovate to broadly ovate with rounded apex prophyll at base of spikelet. Stamens 2, the anthers 0.7-1 mm long, apiculate at apex, minutely papillate at base; style 2-branched, ½ to ⅔ length of style. Achene biconvex, obovate to broadly obovate, obtuse to subrounded at base, truncate at apex, 0.7-1 × 0.6-1 mm, rugulose-papillate with lanceoloid, blunt projections, brown to dark brown; epidermal cells isodiametric with coarsely buttressed, conical nodules; style base deltoid medially, 0.2-0.4 mm long, 0.1-0.2 mm wide at base, hard, brittle, dark brown, the base forming a concave channel with flaring flange-like margins that are decurrent and contiguous along margins of achene body to base, the channel abruptly widening on each side at base; bristles absent.

Distribution: Endemic to the Guayana shield (Venezuela and Guyana).

Habitat in the Guianas: Forming mats on saturated soils of river banks, edges of creeks, and stream borders in forest, 80-212 m.

Distinguishing features: Closely related to *R. reptans* but differs in having culms that are narrowly wing-angled (at least distally) and broadest just below inflorescence head vs. not wing-angled; a coarser rugulose-papillate achene surface; and a style base that forms a concave channel with flaring flange-like margins that are decurrent and contiguous along margins of achene body to base, the channel abruptly widening on each side at base of the achene.

Specimens examined: GUYANA: SE Kanuku Mts, ± 8.5 km ENE of Makawatta Mountain, creek islands and along Crabwood Creek, 03°07'36"N, 59°17'11"W, 200-212 m, 23 Oct 1991, *B. Hoffman & D. Gopaul 373* (NY, US); South Rupununi savanna, Kobawaizwarum, 12 km NW of Aishalton, 02°35'N, 59°22'W, 200 m, 2 Feb 1994, *T.W. Henkel & R. James 3684* (F, US); Rupununi Northern Savanna, Pururi Creek, about 8 mi. NW of Karanambo, 03°50'N, 59°10'W, 80 m, 22 Oct 1996, *C.N. Horn & J. Wiersema 11071* (US).

50. Rhynchospora pilosa (Kunth) Boeck., Linnaea 37: 537. 1873. *Dichromena pilosa* Kunth, Enum. Pl. 2: 279. 1837. TYPE: Brazil, *Sellow s.n.* (holotype: B, destroyed; isotypes: K!, P, W). Figs. 32, 72C-D.

Dichromena minarum C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 32. 1908, non *Rhynchospora minarum* Steud., 1855. *Rhynchospora graminosa* H. Pfeiff., Repert. Sp. Nov. Regni Veg. 38: 95. 1935, *nom. nov.* SYNTYPES: Brazil, Minas Geraes, *Glaziou 20043* (B, destroyed; isosyntype: K); Itacolumi, *Riedel 429* (K; isosyntype: P); Serra de Lapa, *Riedel 959* (K).

Scleria nana Boeck., Allg. Bot. Z. Syst. 2: 158. 1896. *Dichromena nana* (Boeck.) Core, Brittonia 1: 243. 1934. *Rhynchospora nana* (Boeck.) H. Pfeiff., Repert. Sp. Nov. Regni Veg. 49: 82. 1940. TYPE: Brazil, *Glaziou 20043* (holotype: B, destroyed; isotypes: K, P-4).

Caespitose perennial, 10-38 cm tall; rhizome short, ascending to horizontal; roots medium to coarse, cellular-reticulate roughened. Culms erect or curving over with age, 0.4-1.5 mm wide, trigonous to obtusely so, flexuous, coarsely ribbed, green, densely pilose to glabrous. Leaves numerous, primarily basal, 1 or 2 lower cauline, 1-25 cm long; sheaths eligulate, herbaceous to submembranous, finely and closely veined, pilose, pale green, light yellow-brown basally, the inner band herbaceous or submembranous distally with a truncate orifice; blades linear, flattened proximally, subplicate or plicate distally, 0.9-2.6 (-3) mm wide, herbaceous, closely finely and coarsely veined abaxially, some veining evident on adaxial surface but essentially finely cellular-reticulate and smooth, adaxial midvein glabrous, abaxial surface pilose, margins pilose, narrowing to a long acuminate triquetrous or subflattened apex. Inflorescence a globose or hemispherical head of congested spikelets at the summit of the culm, 7-17 mm in diameter, with 4-85 spikelets; involucral bracts 3-5, 1-7 cm long, the lowermost one longest, erect to ascending, the ones above divergent to reflexed at maturity; spikelets lanceolate-attenuate, 5.5-7 × 1-1.5 mm, attenuate to apex, obtuse to subrounded at base; scales obtuse to subrounded dorsally, upper fertile scales herbaceous, finely cellular-striate, lower fertile scales thickened-herbaceous, glossy, light brown with brown sides, pilose distally, glabrous on sides proximally, margins entire, escarious, midcosta very fine, pale, coarsely pilose distally, prolonged beyond the acute to long-acuminate apex as an awn on proximal scales, the upper (distal scales) mucronate; fertile scales 4 or 5, ovate-elliptic (lowermost scale), lanceolate to linear-lanceolate (upper scales), 3.3-6.5 × 1-1.6 mm; sterile scales 2 or 3, narrowly ovate, ovate, or ovate-elliptic, 2-3 × 1-1.4 mm. Stamens 2 or 3, the anthers 1.7-2.9 mm long, apiculate at apex, truncate and minutely papillate at base; style entire or shortly bifid, very long-exserted beyond apex of subtending scale. Achene biconvex, obpyriform, 1.4-1.7 × 0.8-1.3 mm, finely transversely rugulose, often indistinctly so, abruptly contracted below middle, narrow and stipe-like to base, estipitate, obtuse at apex, light brown to brown, often flecked with brown-black at maturity; epidermal cells linear, vertically oriented; style base depressed-triangular to rarely triangular, small and cap-like, not distinctly articulate with achene apex, 0.1-0.2 (-0.3) × 0.3-0.4 mm, elliptic as seen from above (looking down on it), brittle, red-brown; bristles absent.

Distribution: South America (Venezuela, Guyana, and Brazil).

Habitat in the Guianas: Only a single collection seen; wet places in savanna, Mt. Aymatoi, Pakaraima Mountains, Guyana, 1150 m.

Discussion: Closely related to *R. arenicola* but differs in the more slender habit, leaf blades softer with a glabrous adaxial midvein, smaller achenes that are abruptly narrowed below the middle and stipe-like to base, and a depressed, cap-like style base that is not articulate with achene apex. *Rhynchospora arenicola* generally has a coarser habit, often wider, stiffened leaves with a hispid adaxial midvein, a larger achene that is more gradually narrowed to the base, and a subconical style base that is articulate with achene apex.

Specimens examined: GUYANA:Pakaraima Mountains Mt. Aymatoi (sandstone), 1150 m, 05°55'N, 61°00'W, 15 Oct 1981, *P.J.M. Maas et al. 5694* (F, K, MO, NY, P, U).

51. Rhynchospora polyphylla Vahl, Enum. Pl. 2: 230. 1805. TYPE: Monserrat, *Ryan s.n.* (holotype: C-Vahl, microfiche US ex C). Figs. 32, 64A-B.

Rhizomatous perennial, (45-) 85-135 cm tall; rhizome short, knotty, sometimes ascending; roots coarse to medium; sheathing base of culm 2.5-8

mm wide. Culms ascending or clambering over other vegetation, 2.3-5.3 mm wide, obtusely trigonous, stiff and hardened, finely and closely ribbed, often faintly so, channeled along one side distally, light brown proximally, green distally, essentially glabrous. Leaves ascending to spreading, numerous, primarily cauline, internodes short mid-culm and distally (leaves closely spaced), 4-38 (-58) cm long, the lower cauline blades shorter than the mid to upper cauline ones; sheaths somewhat loose, short mid-culm, elongate proximally, herbaceous, finely and closely veined, green distally, light brown proximally, short-pilose to glabrous, inner band membranous, red-brown and finely appressed-pubescent on proximal sheaths, membranous only at orifice on distal sheaths, the orifice truncate, often tomentose; ligule a thin line or band of tissue at adaxial junction of sheath and blade; blades linear, 3.7-10.5 mm wide, flattened-plicate, herbaceous, green both sides, sparsely pilose to glabrous abaxially, scabridulous adaxially, at least distally, margins and abaxial midvein antrorsely scabrous, attenuate to triquetrous apex. Inflorescence a terminal and series of 1-6, open to subcontracted, partial pyramidal panicles from the upper leaf-like bracts; terminal panicle largest, 3-8 × 2-6 cm, with 48-310 spikelets, the lower successively smaller; inflorescence branches sharply angled, the angles pilose; spikelets narrowly ovoid-ellipsoid to ovoid-lanceoloid, 3.8-5.5 × 0.7-1.4 mm, narrowly acute to acuminate at apex, short-cuneate at base; scales dorsally rounded to broadly rounded, herbaceous (proximal scales), submembranous to membranous (distal scales), dull, uniformly whitened-stramineous to pale brown, reddish lineolate (often faintly so), glabrous, margins narrowly scarious, distal scales inrolled, midcosta inconspicuous, wire-like, pale, prolonged as a mucro beyond the acute to short-acuminate apex; fertile scales 6-11, ovate-elliptic to widely ovate-lanceolate, 2.5-4 × 1.3-3.2 mm; sterile scales 3 or 4, ovate to ovate-elliptic, 1.3-2.3 × 0.6-1.5 mm. Stamens 3, the anthers 1-2.3 mm long, subulate-apiculate at apex, truncate with minute papillae at base; style entire, exserted beyond subtending scale. Achenes biconvex, obovate or rounded-obovate, 0.8-1.2 × 0.6-0.8 mm, rounded at apex, widely short-attenuate at base, cancellate with 7-10 vertical rows of horizontally oriented rectangular cells, red-brown; epidermal cells rectangular, horizontally oriented; style base triangular, attenuate to apex, slightly sagittate (shallowly 2-lobed) at base, 0.4-1 mm long, 0.5-0.7 mm wide at base, thin, brittle, light brown, dotted or flecked with dark brown; bristles 0-6, several often rudimentary, shorter than to equaling middle of achene body, antrorsely barbed, reddish.

Distribution: Southern Mexico, Central America (Guatemala, Honduras, Nicaragua, El Salvador, Costa Rica, and Panama), Greater Antilles (Cuba, Hispaniola, Jamaica), Lesser Antilles, Trinidad, Tobago, and South America (Colombia, Venezuela, Guyana, Brazil, and Bolivia).

Habitat in the Guianas: Openings in montane forest.

Distinguishing features: See discussion under *Rhynchospora tuerckheimii.*

Specimens examined: GUYANA: Without locality or date, *R. Schomburgk s.n.* (NY); Roraima, 1863-1864, *C.F. Appun 1229* (K); 9 km W of Paruima, 0.5-1.0 km E of Ararata scrub area, 05°49'36"N, 61°08'40"W, 780 m, 6 Jul 1997, *H.D. Clarke et al. 5420* (US).

52. Rhynchospora pubera subsp. **parvula** W. W. Thomas, Mem. New York Bot. Gard. 37: 50. 1984. TYPE: Colombia; Meta, *Pennell 1501* (holotype: US!; isotypes: GH, MO!, NY!). Figs. 34, 77C-D.

Caespitose annual or perennial, 4-31 cm tall. Culms erect to spreading-ascending, obtusely triquetrous, 0.3-0.7 mm wide, closely ribbed, puberulent to glabrous, often dark green between the green or pale green ribs. Leaves primarily basal, or 1 or 2 lower cauline, 2-20 cm long; sheaths eligulate, loose, finely nerved, glabrous to puberulent, green, the inner band membranous, with concave to deeply U-shaped, glabrous to ciliate orifice; blades 1.4-3.5 mm wide (widest point at very base), flattened to occasionally involute, ciliate to glabrous on margins, green, glabrous adaxially, often cellular-reticulate proximally, glabrous to puberulent abaxially. Inflorescence a congested head of 3-17 spikelets at the summit of the culm, 5-10 mm in diam.; involucral bracts 3-5, leaf-like, exceeding the inflorescence, ciliate basally along margins, the lowermost 1-7 cm × 1-2.3 mm; spikelets ovoid, somewhat laterally compressed, 3.5-5.3 × 2-4 mm, broadly acute at apex, obtuse to rounded at base; scales 7-20 per spikelet, white to whitish

stramineous, often reddish lineolate, boat-shaped, basal scales laterally compressed and acutely keeled, some of those above often dorsally compressed and nearly flat at maturity, puberulent to glabrous abaxially, margins narrowly scarious, midcosta very fine, wire-like, inconspicuous proximally, often ciliolate, not prolonged beyond the emarginate or obtuse to acute apex; fertile scales ovate-triangular or triangular-lanceolate, the distal ones narrower and lanceolate, 2.3-3 × 0.7-1.7 mm; sterile scales 0 or 1 at base, hyaline, triangular-ovate, 1.5-2 × 0.5-1 mm. Stamens 3, 0.8-1.3 mm long; style 2-branched, the branches $^2/_3$ to as long as unbranched portion. Achenes biconvex, very widely obovate to depressed-obovate, 0.8-1.1 × 0.7-1.2 mm, transversely rugose, stramineous to orange-brown or blackish, broadly rounded at apex, rounded to an abruptly narrowed cellular-reticulate base; epidermal cells linear, vertically oriented; style base shallowly triangular, 4-lobed, with 2 short lobes medially and 2 strap-like lobes on achene shoulders, these often with rounded or upturned ends, 0.2-0.4 mm long, 0.7-0.9 mm wide at base, grayish or brownish; bristles absent.

Distribution: Central America (Costa Rica and Panama) and South America (Colombia, Venezuela, Guyana, Suriname, and Brazil).

Habitat in the Guianas: Savanna.

Specimens examined: GUYANA: Rupununi Northern Savanna, Stand 24, 2 mi. S of St. Ignatius, ca. 350 ft, 17 Sep 1963, *R.J.A. Goodland & R. Persaud 733* (NY); Karanambo, savanna near airstrip, 4 Sep 1988, *P.J.M. Maas et al. 7268* (B, CAY, K, NY, U, US); Between Karanambo and Kwaimatta, 27 Sep 1988, *P.J.M. Maas et 7713* (B, CAY, K, NY, U, US); Rupununi Northern Savanna, Pururi Creek, 8 mi NW of Karanambo, 03°50'N, 59°10'W, 80 m, 22 Oct 1996, *C.N. Horn & J.*

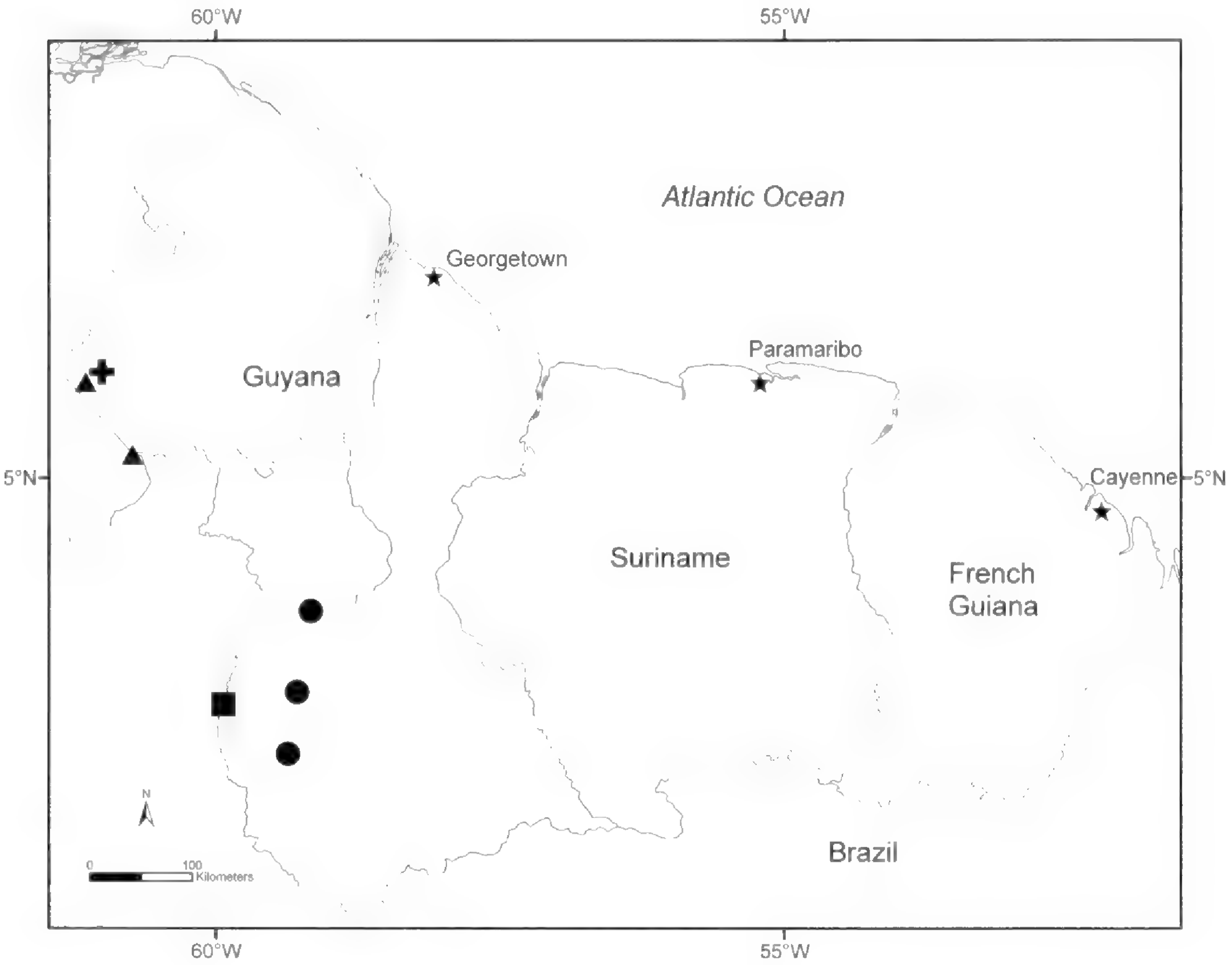

Fig. 32. Distribution of ■*Rhynchospora nitens*; ●*R. papillosa*; ✚*R. pilosa*; and ▲*R. polyphylla* in the Guianas.

Wiersema 11074 (US). SURINAME: Coppename Rivier, 15 Sep 1901, *H.A. Boon 1152* (U).

53. Rhynchospora pubera subsp. **pubera** (Vahl) Boeck., Linnaea 37: 528. 1872. *Dichromena pubera* Vahl, Enum Pl. 2: 241. 1805. SYNTYPES: French Guiana, Cayenne, *Richard s.n.* (C; isosyntype: P); "in insula Trinitatis", *v. Rohr s.n.*" (C). Figs. 33, 77A-B.

[*Schoenus pubescens* Kunth, in Humboldt, Bonpland, & Kunth, Nov. Gen. et Spec. 1 (quarto ed.): 228. 1815, *nom. illeg.*]

[*Dichromena erostris* Nees, Linnaea 9: 291. 1834, *nom. nud.*].

[*Dichromena humboldtiana* Nees in Martius, Fl. Bras. 2(1): 111. 1842, *nom. illeg.*]

Dichromena unicolor Salzm. ex Steud., Syn. Pl. Glumac. 2: 136. 1855. LECTOTYPE: Brazil, Bahia, *Salzmann s.n.* (US!; isolectotypes: MO!, P-5), designated by W. W. Thomas, Mem. New York Bot. Gard. 37: 47. 1984.

[*Rhynchospora humboldtiana* Griseb., Fl. Br. W. I. 577. 1864, *nom. illeg.*]

Rhynchospora pubera var. *multispiculosa* Kük., Bot. Jahrb. Syst. 75: 308. 1951. LECTOTYPE: Brazil, Pará, *Baker 132* (F; isolectotypes: M, NY, P), designated by W. W. Thomas, Mem. New York Bot. Gard. 37: 47. 1984.

Caespitose annual or perennial, (4-) 6-45 (-50) cm tall. Culms erect to spreading-ascending, obtusely triquetrous, 0.4-0.9 mm wide, closely ribbed, glabrous to puberulent, often dark green between the green or pale green ribs. Leaves primarily basal, or 1 or 2 lower cauline, 3-34 cm long; sheaths eligulate, loose, finely nerved, glabrous to puberulent, green, the inner band membranous, with concave to deeply U-shaped, glabrous to ciliate orifice; blades 1.3-5.5 mm wide, flattened to occasionally involute, ciliate to sparsely so on margins, green, glabrous adaxially, often cellular-reticulate proximally, glabrous to puberulent abaxially. Inflorescence a congested head of 3-15 spikelets at the summit of the culm, 7-17 (-20) mm in diam.; involucral bracts 3-6, leaf-like, exceeding the inflorescence, ciliate basally along margins, the lowermost 2-12 cm × 1.2-4 mm; spikelets ovoid, somewhat laterally compressed, 5.5-8.5 × 2-4 mm, broadly acute at apex, obtuse to rounded at base; scales 8-16 per spikelet, white to whitish stramineous, often reddish lineolate, boat-shaped, basal scales laterally compressed and acutely keeled, some of those above often dorsally compressed and nearly flat at maturity, puberulent to glabrous abaxially, margins narrowly scarious, midcosta very fine, wire-like, inconspicuous proximally, often ciliolate, not prolonged beyond the emarginate or obtuse to acute apex; fertile scales ovate-triangular or triangular-lanceolate, the distal ones narrower and lanceolate, 3.4-5.8 × 1.4-2.6 mm; sterile scales 0 or 1 at base, like the fertile but smaller, 2-4 × 1-2 mm. Stamens 3, 1.3-3.3 mm long; style 2-branched, the branches $^2/_3$ to as long as unbranched portion. Achenes biconvex, very widely obovate to depressed-obovate, 0.9-1.2 (-1.4) × 1-1.5 mm, transversely rugose, stramineous to orange-brown or blackish, broadly rounded at apex, rounded to an abruptly narrowed cellular-reticulate base; epidermal cells linear, vertically oriented; style base shallowly triangular, 4-lobed, with 2 short lobes medially and 2 strap-like lobes on achene shoulders, these often with rounded or upturned ends, 0.2-0.5 mm long, 0.9-1.5 mm wide at base, brown to dark brown; bristles absent.

Distribution: Northern South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, and Bolivia).

Habitat in the Guianas: In a variety of habitats on moist sand or sandy clay soils in savanna, seepages, gravel washes along creeks, rocky stream beds and margins, sand bars, flood plains, marshy areas, pond margins, forest clearings, rock outcrops, granite inselbergs in "savane roche" (rock savanna) communities, successional areas, roadsides, trails, pastures, secondary and scrub forest, disturbed forest, forest edges, and waste areas, 0-650 m.

Specimens examined: FRENCH GUIANA: Without locality or date, *M. Moricand 109* (G-4); Exploitation Matéo, Route de Mana, PK 12, point 26, without date, *A. Leclerc 299* (CAY); Without locality, 1819-1821, *M. Poiteau s.n.* (G); Cayenne, 1835, *M. Leprieur 60* (G-2, P-2); Without locality, 1840, *M. Leprieur s.n.* (G); Cayenne, 1859, *P. Sagot 1355* (K, P); Cayenne, 1867, *H. Jelski s.n.* (B, US); vicinity of Cayenne, hill above Grant's Road, Matabon, 3 Jul 1921, *W.E. Broadway 639* (NY); vicinity of Cayenne, hill above Grant's Road, 25 Jul 1921, *W.E. Broadway 968* (NY); vicinity of Cayenne, 5 Jul 1921, *W.E. Broadway 671* (NY); Without locality, Jul 1824, *M. Poiteau s.n.* (K); vicinity of Cayenne, 5 Jul 1921, *W.E. Broadway 671* (NY); Balaté Creek, 8 Dec 1948, *Service Forestier Guyane 4406* (P, U); Cayenne,

Laboratoire de Botanique, IFAT, 6 Jul 1955, *J.J. Hoock s.n.* (P); Saül, circuit Boeuf Mort, km 10,100, sur la route de Bélizon, 16 Aug 1971, *R.A.A. Oldeman 4014* (CAY-2, P); Saül, sur la route de Bélizon, 7 Oct 1973, *J.J. de Granville 5095* (CAY-2, P, U). Saül, on route to Belizon, 7 Oct 1973, *J.J. de Granville B5095* (NY); Environs de Saint Laurent du Maroni, à 11 km sur la route d'Iracoubo par Carbet Médard, 20 Jan 1974, *B. Descoings & Cl. Luu 20407* (CAY, P); Montagne de 500 m, env. à 2.5 km N de Dégrad Claude (Rivière petit Tamouri), 21 Mar 1974, *J.J. de Granville 2202* (CAY-2, NY, P, U); Bas Oyapock, Saut Maripa, 13 Jul 1976, *J.J. de Granville 2687* (CAY, NY, P); Marais à env. 2.5 km à l'E de Roura (25 km S de Cayenne), 25 Feb 1978, *A. Raynal-Roques 20139* (CAY, P); Dans un abattis sur la route de l'Est quelques kilomètres après le Pont sur la Comtè, 9 May 1978, *G. Cremers 5244* (CAY, NY, P); Bord de la Route du Tour de l'Ile (de Cayenne), niveau de la Rivière du Tour de l'Ile, 5 May 1979, *M.F. Prevost 581* (CAY, P); Montagne de Kaw, environs du Camp Caïman, sur la piste, 11 Jun 1979, *G. Cremers 5685* (CAY-2, NY, P); Route de Cayenne à St. Laurent, PK 185, 10 km après l'embranchement de Mana au Sud près d'un Saut, 08 Oct 1979, *G. Cremers 5953* (CAY, P); Commune de Saint-Georges, Bassin de l'Oyapock, 20 m, 03°53'N, 51°48'W, Aug 1980, *G. Cremers 9799* (CAY); Montagne de Kaw, environs de Camp Caïman, 350 m, 23 Nov 1980, *J.J. de Granville 4207* (CAY, NY, P, U); Along St. Elie track (west from km 105 N of Sinnamary), NW of Sinnamary, beyond km marker 23, ca. 250 m, 05°30'N, 48°00'W, 06 Jul 1982, *T.B. Croat 53839* (CAY, MO); Saül, près du terrain d'aviation au bord de la piste, 23 Jul 1982, *A. Fournet 221* (CAY, P); Piste de St. Laurent a Paul Isnard, PK 60, 16 Nov 1982, *J.J. de Granville 5350* (CAY-2, NY, P); South Cayenne, Lac aux Americains Commune de Matoury, 13 Jun 1983, *C. Feuillet 920* (CAY, NY, P); Cayenne, ORSTOM, 1 Mar 1985, *D.Y.A. Alexandre 263* (CAY); St. Laurent, poste de Paul Isnard, 9 May 1985, *C. Feuillet 2223* (NY); St. Laurent, poste de Paul Isnard, 9 May 1985, *C. Feuillet 2222* (NY); Saül, vicinity of the village, 200-300 m, 03°37'N, 53°12'W, 7-8 Jun 1986, *S.A. Mori & C.A. Gracie 18404* (CAY, NY); Piste de Paul Isnard, along road, in cane field or in pine plantation, 05°26'N, 54°00'W, 5-15 m, 16 Nov 1986, *L.E. Skog et al. 7412* (B, CAY, F, NY, P, U, US), *7413* (B, CAY, NY, U, US); Cayenne, Montagne de Kaw, Pk. 45.5, 15 Mar 1987, *G. Cremers 9605* (CAY, P, U); Saül, Airport road, 200 m, 03°37'N, 53°12'W, 11 Aug 1987, *S.A. Mori & J.D.. Mitchell 18699* (CAY, NY); Savane de Corossony, Piste de Saint-Elie, 10 m, 05°23'N, 53°00'W, 05 Feb 1988, *M. Philippe 62* (CAY); Village Hmong de Javouhey, Bassin de la Basse-Mana, 10 m, 05°35'N, 53°51'W, 22 Mar 1988, *M. Philippe 179* (CAY); Mont Lucas, Ile de Cayenne, 10 m, 04°55' N, 52°17'W, 24 Sep 1988, *M. Hoff 5348* (NY); Loulette, Basin de la Basse-Mana, 20 m, 05°38'N, 53°53'W, 15 Apr 1989, *G. Cremers & M. Hoff 10612* (CAY, NY, P); Saül and vicinity, S of Eaux Claires on the Route de Bélizon, 230-300 m, 03°37'N, 53°12'W, 2 Sep 1994, *S.A. Mori et al. 23808* (NY); Crique Cabassou, Ile de Cayenne, 3 m, 04°54'N, 54°18'W, 14 Aug 2002, *J.J. de Granville & F. Crozier 15659* (CAY, NY, P, U, US); Monts d'Arawa, versant sud, Zone de la savane-roche centrale, 02°49'N, 53°22'W, 220 m, 4 Jul 2002, *J.J. de Granvill et al. 15029* (B, CAY, K, NY, P, US); Mont Saint-Marcel, zone centre est du massif, 450 m, 02°23'00"N, 53°00'20"W, 19 Jul 2002, *J.J. de Granville et al.* (CAY, NY, P, US).

GUYANA: Without locality or date, *C.F. Appun 595* (K), *721* (K); Georgetown, Botanic Gardens, without date, *coll. ign. 100* (K-2); Without locality,1838, *R. Schomburgk 453* (G, K, P-2); Essequibo River, Sep-Oct 1881, *G.S. Jenman 1134* (K); Kaieteur Savanna, Potaro River, Sep-Oct 1881, *G.S. Jenman 1061* (K, P); below the Kaieteur, Potaro River, Sep-Oct 1881, *G.S. Jenman 967* (BRG, P); Bartica, Essequibo River, Aug 1889, *G.S. Jenman 6059* (K, NY, US); Kwaimatta, Rupununi River, Oct 1889, *G.S. Jenman 5721* (K); Macasseema, Pomeroon River, Mar 1904, *G.S. Jenman 7811* (BRG, K, U); Oreala Savanna, Corentyne River, Jun 1916, *C.K. Bancroft 11* (BRG, K); Penal Settlement, on W side of Essequibo River, near mouth of Mazaruni River, 3 Dec 1919, *A.S. Hitchcock 17034* (US); Penal Settlement, 3-9 Dec 1919, *A.S. Hitchcock 17035* (US), *17043* (NY, US); Rockstone, in and about the village, 13-30 Jul 1921, *H.A. Gleason 503* (K, NY, US); Potaro Landing, 27 Jun 1921, H.A. Gleason 476 (K, NY, US); between Demerara and Berbice Rivers, 15-19 Jul 1922, *J.S. de la Cruz 1668* (F, K, MO, NY, US); vicinity of Bartica, on the Essequibo River, 3 Sep 1922, *J.S. de la Cruz 1915* (F, MO, NY, US); Bartica, Essequibo River, 5 Oct 1922, *H. Leng & Persand 2* (US); Bartica, along Mazaruni River, 5 Oct 1922, *H. Leng & R. Persaud s.n.* (B-2, F, NY,

US); Kamakusa, Upper Mazaruni River, 23 Nov 1922, *J.S. de la Cruz 2754* (F, MO, NY, US); Waini River, 3-18 Apr 1923, *J.S. de la Cruz 3592* (F, MO, NY, US); Kalacoon, junction of Mazaruni and Cuyuni Rivers, vicinity of Kartabo Station, 29 Jun 1924, *E.H. Graham 148* (NY, US); Macouria Creek, Essequibo, Aug 1926, *H. Gibson 55* (K); Mazaruni Station, 28 Aug 1937, KEW Expedition to British Guiana 1937, *N.Y. Sandwith 1228* (K, U); Kangaruma, Potaro River, 26 Apr 1944, *B. Maguire & D.B. Fanshawe 22998* (K, NY, U, US); Mazaruni Station, 24 Jun 1945, *Forestry Department British Guiana 379* (K-2, U-2); 1 mi. W of Atkinson Field, near Demerara River, 1 May 1954, *H.S. Irwin 250* (US); Waranama, Berbice River, Jun 1957, *K.O. Williams 83* (BRG); Ebini Experimental Station, Berbice River, 5 Apr 1958, *S.G. Harrison 747* (BRG, K); Amatuk Falls, Potaro River, 13 Aug 1959, *B.A. Whitton 74* (K); Wiaka Landing, W Coast Essequibo, 10 Apr 1960, *S.A. Harris TP326* (K); Annandale, Essequibo, 29 Jun 1960, *S.A. Harris 450* (K-2); Bartica, Essequibo River, Oct 1966, *D.H. Davis 66* (BRG, K, NY); Bartica-Potaro Road, 24 mi. S of Bartica at Forest service "24 Mile Camp", 50-125 m, 14 Aug 1976, *S.A. Mori et al. 8083* (K, NY, U); S of Timehri, Mr. Adrian Thompson's Farm, 16 Oct 1979, *P.J.M. Maas et al. 3581* (K, MO, NY, U); Rockstone, 5 Aug 1982, *C.D. Adams 3* (BM, BRG, TRIN); Tumatumari, Potaro River, Oct 1983, *A. Cooper 322* (BRG, U); Mabura Hill, 0-50 m, 05°20'N, 54°40'W, 18 Mar 1988, *H. ter Steege et al. 303* (CAY-2, NY, U); Karanambo, Rupununi River, 2 Sep 1988, *P.J.M. Maas et al. 7197* (B, CAY, K, NY, U, US); Capoey Mission, west shore of Capoey Lake, ± 5 km W of Queenstown, 07°12'N, 58°32'W, 0-10 m, 22 Apr 1989, *L.J. Gillespie & H. Persaud 1120* (MO, NY, U, US); Along west bank of the canal between St. Lawrence and Hubu, 06°49'N, 58°28'W, 2 m, 19 Oct 1989, *C.L. Kelloff*

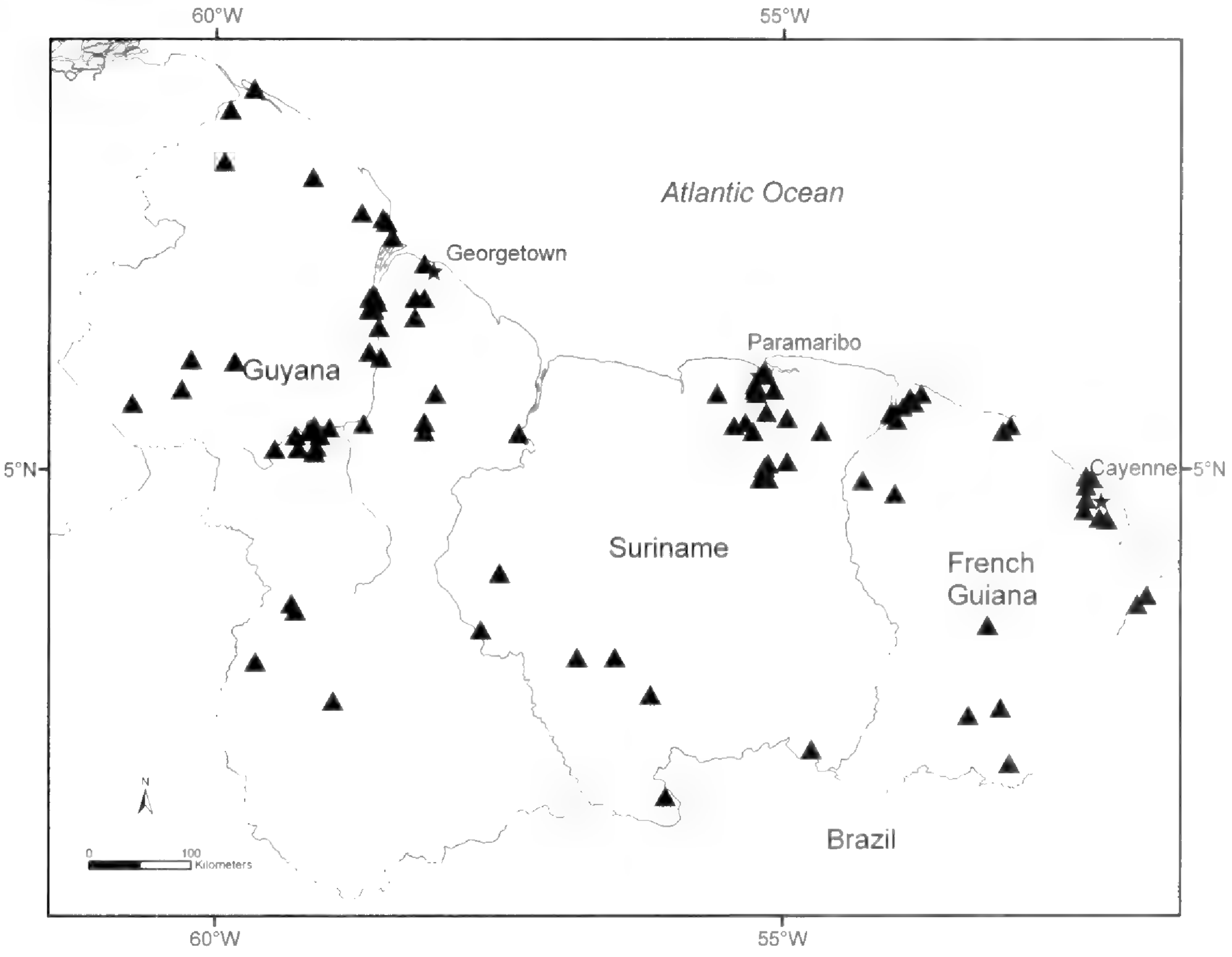

Fig. 33. Distribution of *Rhynchospora pubera* subsp. *pubera* in the Guianas.

et al. 625 (NY, US); 16-22 km from Ituni along Ituni-Kwakwani Road, 05°25'N, 58°10'W, 70 m, 19 Jan 1990, *L.J. Gillespie et al. 3090* (MO, NY, U, US); Along roadside between Urisirima, on Essequibo, and Rockstone, 06°15'N, 58°34'W, 10-30 m, 23 Jan 1990, *T. McDowell et al. 1797* (NY, US); In woods along creek at SW base of Eagle Mountain and along Potaro-Konawaruk Road, 05°12'N, 59°07'W, 107-152 m, 12 Oct 1990, *T. McDowell & D. Gopaul 3533* (NY, U, US); From camp on Elizabeth Creek, ± 1 km along road to NE and along creek, 05°18'N, 59°05'W, 122 m, 16 Oct 1990, *T. McDowell & D. Gopaul 3599* (NY, U, US); N bank, W branch of Eping River, 05°58'N, 60°13'W, 396 m, 7 Feb 1991, *T. McDowell & A. Stobey 3930* (NY, US); Porkknocker camp, end of Mahdia Road, confluence of N Fork River and Minihaha Creek, 05°09'N, 59°08'W, 107 m, 25 May 1991, *T. McDowell et al. 4944* (NY, U, US); Upper Kaituma River, 5 km SW of Port Kaituma, "Jonestown Road", 07°42'N, 59°55'30"W, 30-40 m, 7 Dec 1991, *B. Hoffman et al. 505* (NY, US); Pakaraima Mountains, Kurupung-Membaru trail, 2.75 km from Kumarau Falls, 06°05'N, 60°23'W, 650 m, 22 Jul 1992, *B. Hoffman & G. Marco 2134* (NY, US); Lower 7 km of Tiger Creek, 06°30'N, 58°39'W, 0-15 m, 12 Dec 1992, *T.W. Henkel & M. Chin 511* (NY, US); Radius of 0.5 km around Goldmine settlement, 06°32'N, 58°37'W, 0-15 m, 20 Dec 1992, *T.W. Henkel & M. Chin 621* (US); Swarte Hoek Point, Essequibo River, 06°31'N, 58°36'W, 8 m, 24 Aug 1993, *T.W. Henkel & R. Williams 2720* (US); Mabura Hill, village, garden R. Ek., 05°20'N, 58°10'W, 15 Oct 1993, *R.C. Ek & H. Maas 987* (NY); Kwitaro River, Brian's Landing, 100 m, 02°57'N, 58°58'W, 16 Feb 1994, *M.J. Jansen-Jacobs et al. 3824* (U); 1 km from the Omai ferry, along the Essequibo, S. of Linden, 05°24'N, 58°42'W, 50-75 m, 2 Oct 1994, *C.L. Kelloff & C. Roesel 1152* (US); Kanuku Mountains, Moco Moco River, 340-370 m, 19 Jul 1995, *M.J. Jansen-Jacobs et al. 4591* (U, US); along highway from Georgetown to Linden, 1.3 km from jct. with highway to Timehri Airport, 06°30'N, 58°10'W, 30-40 m, 13 Aug 1995, *C.N. Horn & S. Hill 10021* (US); Parabara Savanna, trail from Karaudarnau to Kuyuwini River, 02°11'58"N, 59°22'14"W, 270 m, 1 Jun 1997, *H.D. Clarke 5119* (NY, US); Waini River, Kwebana, vicinity of abandoned sawmill, 07°33'34"N, 59°08'52"W, 5-10 m, 22 Oct 2001, *T.H. Hollowell & Wiltshire Hinds 613* (US); Wauna village, 08°09'03"N, 59°52'29"W, 20 m, 4 Nov 2001, *T.H. Hollowell et al. 718* (US). SURINAME: Without locality or date, *F.W.R. Hostmann 958* (G, U); Without locality or date, *M. Weigelt s.n.* (G); Without locality or date, *F. Voltz s.n.* (U); Paramaribo and vicinity, without date, *H.C. Focke 481* (U); Without locality,1841!, *M. Berthoud-Coulon 49* (MO, NY, U); Without locality, 1843, *F.W.R. Hostmann 950* (K); Para [in Sylva Martie], 1849?, *H.C. Focke s.n.* (U); Paramaribo, 1904!, *G.M. Versteeg 487* (U); Lucie Rivier, 6 Dec 1910, *J.F. Hulk 395* (U); Paramaribo, 1 rijweg, 11 Jun 1913, *Soepra[p]ta 6d* (K, MO, NY, U); Paramaribo, Jul 1914, *E. Essed 101* (U); Lectie O., 30 Apr 1915, *G. Stahel & J.W. Gonggrijp 75* (U); Div. Q (Uncult.) Agricultural Experiment Station, Paramaribo, 10 Apr 1916, *J.A. Samuels 2* (F, K, NY, P); Culhuurtuin, Paramaribo, 23 Aug 1920, *A.A. Pulle H81* (U); Suriname Rivier near Kabelstation, 9 Nov 1933, *J. Lanjouw 1201* (U); Charlesburg Rift, 3 km N of Paramaribo, 5 Apr 1944, *B. Maguire & G. Stahel 22721* (F, K, NY, U, US); Zanderij II, 3 Jun 1944, *B. Maguire & G. Stahel 23644* (NY, U); near Para bridge on road to Domburg, 9 Mar 1951, *D.C. Geijskes 59* (US); Wegkant bij Para brug in weg near Domburg , 11 Mar 1951, *D.G. Geyskes [wit Bloem] 59* (U); Along branch of railroad near km 121, 21 Mar 1951, *J. Florschütz & P.A. Florschütz 1885* (NY, U); Lely dorpplan, Sawarieweg, 5 Aug 1952, *Ir J.G.P. Dirven LP256* (U); Jodensavanne-Mapane Kreek area (Suriname Rivier), 23 Apr 1953, *J.C. Lindeman 3707* (U); Lely dorppan, Vak C, oude ananasakker, 14 Jul 1953, *Ir J.G.P. Dirven LP415* (U); Verlengde de Craneweg, 15 km SW of Paramaribo, 21 Dec 1955, *A.M.E. Jonker-Verhoef & F.P. Jonker 225* (F, U); Van Hattumweg II,19 Sep 1958, *Ir J.G.P. Dirven LP688* (U); Pad van Wanica, 181 m, 16 Sep 1959, *Ir J.G.P. Dirven LP716* (U); Paramaribo [Cult.], 1 Apr 1960, *P.H. van Doesburg Jr. 46* (U); In vicinitate urbis Paramaribo, southwest outskirts of the town, 23 Nov 1960, *K.U. Kramer & W.H.A. Hekking 2144* (C, U); between villages Brownsweg and Saramacca, 12 Feb 1963, *J.G. Wessels Boer 660* (U); Wilhelmina Gebergte, Zuid River, bordering Kayser airstrip, ca. 25 km above confluence with Lucie River, 270 m, 03°20'N, 56°29'W, 2 Jul 1963, *B. Maguire et al. 53968* (NY); Wilhelmina Gebergte; Zuid Rivier, 2 km above confluence with Lucie Rivier, 220 m, 03°20'N, 56°29'W, 5 Jul 1963, *B. Maguire et al. 54034* (NY); Zuid Rivier

& Lucie Rivier, 5 Jul 1963, *J.P. Schulz 10047* (U); 5 km W of Albina, 21 Apr 1965, *P.J.M. Maas 3187* (U); Eilerts de Haan Gebergte, 4 km from Zuid Rivier, 14 Aug 1963, *J.P. Schulz 10411* (NY, U); Sipaliwini Savanne, W part, 4 Jan 1969, *F.H.F. Oldenburger & R. Norde 680* (U); Sipaliwini Savanne area on Brazilian frontier, 20 Jan 1969, *F.H.F. Oldenburger & R. Norde 978* (NY, U); near Brokopondo village, 1 Mar 1969, *J. van Donselaar 3874* (K, U); Sipaliwini Savanne area on Brazilian frontier, N of S-camp I, southern Sipaliwini Savannah, 280 m, 19 Jan 1970, *F.H.F. Oldenburger et al. 1014* (K, U); Costerie Kreek (Coesewijne), Jan 1978, *J. Procter 4698* (NY, U); Brownsberg Nature Preserve, forested plateau, 450-500 m, 24-25 Sep 1979, *W.W. Thomas 2368* (NY); Brownsberg Nature Preserve, forested plateau, 450-500 m, 24-25 Sep 1979, *W.W. Thomas 2359* (MO, NY); Hanover, 1 km E of road to airport, 29 Sep 1979, *W.W. Thomas 2398* (MO, NY); Hanover, 1 km E of road to airport, 30 Sep 1979, *W.W. Thomas 2399* (MO, NY); area of Kabalebo Dam project, 30-130 m, 16 Nov 1981, *J.C. Lindeman & A.C. de Roon 854* (NY, U); Along road between Berg en Dal and Brownsweg, 5 km N of railroad tracks in Brownsweg, ca. 150 m, 05°03'N, 55°08'W, 20 Jul 1982, *T.B. Croat 53876* (MO); Experimental farm Kabo, 28 Oct 1982, *A.P. Everaarts 685* (U); Experimental farm Coebiti, 22 Dec 1982, *A.P. Everaarts 579* (U); Experimental farm Kabo, 22 Dec 1982, *A.P. Everaarts 722* (U); Experimental farm Kabo, 26 Jan 1984, *A.P. Everaarts 909* (U); Tumuc Humac Mountains, Talouakem, 02°31 N, 54°45W, 500 m, 13 Aug 1993, *P. Acevedo-Rdgz et al. 6015* (CAY, NY, US).

54. Rhynchospora pubisquama M. T. Strong, Novon 11: 270. 2001. *Rhynchospora cephalotes* var. *angustifolia* Uittien, Recueil Trav. Bot. Néerl. 30: 188. 1933, non *Rhynchospora angustifolia* Palla, Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. 79: 193. 1908. LECTOTYPE: Suriname; Upper Gran Rio, *Hulk 346* (U, sheet #031820), designated by M. T. Strong, Novon 11: 270. 2001. Figs. 34, 61C-D.

Rhizomatous perennial, 35-110 cm long, forming large tussocks; rhizome horizontal to ascending, 3-8 mm thick; roots coarse, dark brown; sheathing base of culm 7-10 mm wide, bearing fibrous remnants of old leaf bases. Culms ascending, 1-3 mm wide, trigonous with obtuse to subrounded angles, firm, finely and coarsely ribbed, dark green, short-pilose to glabrous. Leaves ascending, numerous, primarily basal, 1-3 cauline, 17-120 cm long; sheaths eligulate, short, finely and coarsely veined with the larger veins dark green proximally, short-pilose to densely so (particularly near nodes) or glabrescent dorsally, inner band membranous and finely veined on basal sheaths, splitting with age, herbaceous and prominently veined on cauline ones, often puberulent, the orifice U-shaped, subthickened along margin, puberulent on basal sheaths, ciliate along margin on cauline sheaths; blades narrowly linear, 2.5-6 (-10) mm wide at widest point, herbaceous, flattened-plicate, finely veined, green, abaxially short-pilose to glabrescent, glabrous adaxially with densely short-pilose midvein, the margins antrorsely scabrous and often ciliate (at least proximally), attenuate to triquetrous tip. Inflorescence a single narrow, oblong, shortly branched panicle of 15-260 loosely congested spikelets at the apex of the culm, or sometimes a smaller second one below, 1.8-8 × 1.2-2 cm; involucral bracts 1 or 2, leaf-like, elongate, greatly exceeding the inflorescence, to 70 cm long, antrorsely scabrous on margins distally and long-ciliate on margins proximally, often pubescent adaxially proximally; spikelets ovoid-ellipsoid, acute to acuminate at apex, obtuse at base, 4-6 × 1-1.5 mm, spreading to 2 mm wide with mature achenes; scales 11-20 per spikelet, puberulent, minutely ciliate on margins, dorsally rounded, inrolled, cellular-striate, midcosta indistinct, very narrow, dark green at apex, prolonged beyond the acute apex as a 0.5 mm mucro; fertile scales 5-8, tightly inrolled, herbaceous to submembranous, completely hidden by outer sterile scales, ovate to ovate-elliptic or subrounded, pale brown to brown, reddish brown lineolate, 3-5 × 2-3 mm; sterile scales 6-12, thickened, subcoriaceous, ovate to ovate-elliptic or subrounded, light brown to reddish brown, 0.5-4 × 1-2 mm, upper sterile scales about the same size as sterile scales. Stamens 3, the anthers 2-3 mm long, apiculate, minutely lobed at base; style deeply 2-branched, the stigmas as long as or slightly longer then unbranched portion. Achene biconvex, obovate, truncate at apex, short attenuate at base, 1.4-2.1 × 1-1.5 mm, shallowly reticulate, semi-glossy, yellow-brown, with pale wire-like margin, sometimes becoming distorted or blasted at maturity as a result of insect attacks; epidermal

cells isodiametric, no central nodules evident; style base triangular-lanceolate, acuminate to apex, 2-3 mm long, 1-1.7 mm wide at base, thin and brittle, pale brown, the base as wide as apex of achene; bristles 6, subflattened proximally, becoming filiform distallly, elongate, exceeding achene, equaling or exceeding tip of style base, antrorsely barbed, reddish brown.

Distribution: Endemic to the Guianas (Suriname and French Guiana).

Habitat in the Guianas: Rocky openings, granitic outcrops, granite inselbergs in "savane roche" (rock savanna) communities, and scrub, 625-780 m. Occurs on Tafelberg Mountain (southern end of Emma Keten mountain range) and in the Wilhelmina mountains of Suriname, and at Pararé rapids along the Arataye River on a slope of an inselberg and on Mt. Nouragues in the Balenfois Mountains of French Guiana.

Discussion: Rhynchospora pubisquama is a species of *R.* section *Cephalotae* Kük. It is closely related to *R. cephalotes* (L.) Vahl and has been described as a variety of that species (*R. cephalotes* var. *angustifolia*) by Uittien (1933). It differs from *R. cephalotes* in having narrower leaf blades (2.5-6 (-10) mm wide); a narrow, oblong inflorescence; puberulent spikelet scales; semi-glossy, shallowly reticulate achenes; and a triangular-lanceolate style base that has a narrow rim between its base and the apex of the achene, while *R. cephalotes* has broader leaf blades ((4-) 5-15 mm wide); an ovoid to oblong-ovoid, pyramidal, or subglobose inflorescence; glabrous spikelet scales; a transversely rugulose-reticulate achene; and a lanceolate-attenuate style base that overlaps the shoulders of the achene at its base.

Specimens examined: FRENCH GUIANA: Fleuve Approuague, Rivière Arataye, Saut Pararé, 22 Oct 1978, *C. Sastre 6221* (CAY, P); Montagne des Nouragues, Bassin de l'Arataye, sommet, 04°03'N, 52°42'W, 15 Jul 1988, *C. Sarthou 408* (CAY). SURINAME: Fluv. Gran Rio, 10 Oct 1910, *J.F. Hulk 346* (U); Exp. Wilhelminageberte, 5 Aug 1926, *G. Stahel 585* (U); Plants of Tafelberg (Table Mountain), 1 km SE Savanna No. VIII, 780 m, 29 Aug 1944, *B. Maguire 24559* (F, K, U, US); Plants of Tafelberg (Table Mountain), Grace Falls, Arrowhead Basin, 625 m, 26 Aug 1944, *B. Maguire 24493* (F, G, K, MO, P, U, US).

55. Rhynchospora radicans subsp. **microcephala** (Bertero ex Spreng.) W. W. Thomas, Mem. New York Bot. Gard. 37: 60. 1984. *Dichromena microcephala* Bertero ex Spreng., Syst. Veg. 1: 202. 1824. *Rhynchospora microcephala* (Bertero ex Spreng.) Kük., Bot. Jahrb. Syst. 75: 311. 1951, non Britton ex Small, 1903. TYPE: West Indies; "America meridionalis" [Jamaica], *Bertero s.n.* (holotype: TO; isotype: MO!). Figs. 34, 77E-F.

Rhynchospora pubera var. *microcarpa* Boeck., Linnaea 37: 529. 1872. LECTOTYPE: Trinidad, *Sieber 3* (MO; isolectotype: M), designated by W. W. Thomas, Mem. New York Bot. Gard. 37: 60. 1984.

Annual or short-lived caespitose perennial, 10-63 cm tall; rhizome, when present, short; roots medium. Culms arching to erect, 1-2 mm wide, triquetrous to obtusely so, compressed distally, coarsely and finely ribbed, smooth, green, glabrous, often elongating and lopping over to the ground at maturity, the inflorescence heads proliferating. Leaves (2-) 3-4 (-5), ascending, primarily cauline or from sterile shoots, the basal leaves, when present, often with reduced blades or represented by bladeless sheaths; sheaths loose, short to medium in length, finely veined with pale veins, green distally, pale green proximally, glabrous; ligule absent; blades linear, herbaceous, 5-30 cm × 1.4-5 mm, flattened to slightly involute, finely nerved, distinctly so abaxially, with whitened to pale green nerves, often ciliate marginally at base, green to dark green, essentially smooth, glabrous. Inflorescence a conical to hemispherical head of 3-6 (-7) spikelets at the summit of the culm, 0.8-1.5 cm in diam., the central spikelet largest; involucral bracts (3-) 4-5 (-6), leaf-like, spreading to reflexed, exceeding the inflorescence, ciliate basally along margins, the basal bract longest, 4-15 cm long, 1.5-4.5 mm wide; spikelets 3-6 (-7), ovoid, 7-12 × 2-4.3 mm, acute to acuminate at apex, rounded at base, with ca. 20-30 scales; scales all fertile except for basal scale of spikelet, boat-shaped, dorsally obtuse to rounded, submembranous, margins broadly scarious, whitish or stramineous to pale brown, reddish lineolate, glabrous, the midcosta fine, inconspicuous, pale green, extended beyond the narrowly acute to acuminate apex as a very short mucro; fertile scales ovate to ovate-lanceolate, 4.2-5.2 × 1.8-3.6 mm; sterile scale like the fertile. Stamens 3, the anthers 1.3-1.7 mm long, apiculate, truncate at base with

minute crystalline papillae or glands; style 2-branched to about the middle. Achene biconvex, very widely obovate, 0.9-1.2 × 0.8-1.4 mm, bilaterally symmetrical, broadly rounded at apex, cuneate to widely cuneate or sub-rounded at base, transversely rugulose, epidermal cells rectangular, vertically oriented, stramineous to brownish orange or bony-white; style base very shallowly triangular to shallowly lunate, 0.1-0.4 mm long, 0.6-1.2 mm wide at base, brownish to stramineous or greenish; bristles absent.

Distribution: Hawaii, Mexico, Central America, West Indies, Trinidad, Tobago, South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, northern Brazil, Bolivia, and Ecuador).

Habitat in the Guianas: Creek or stream banks, disturbed forest, secondary forest, pastures, clearings, and early successional areas.

Specimens examined: French Guiana: Without locality, 1819-1821, *M. Poiteau s.n.* (G); Without locality, Jul 1824, *M. Poiteau s.n.* (K); S of Cayenne, lac aux Americains, Commune de Matoury, 13 Jun 1983, *C. Feuillet 916* (NY); Saül, vicinity of the village, 200-300 m, 03°37'N, 53°12'W, 7-8 Jun 1986, *S.A. Mori & C.A. Gracie 18380* (CAY, NY); Saül, Route de Belizon, 200 m, 03°37'N, 53°12'W, 18 Jul 1987, *S.A. Mori 18495* (CAY, NY). Guyana: upper Mazaruni River, 22 Sep 1922, *J.S. de la Cruz 2151* (F, MO, NY, US); Wabuwak, Kanuku Mountains, 2000 ft, Sep 1948, *Fr. G. Wilson-Browne* (*Forestry Department British Guiana*) *WB218* (K, NY, U); 5 mi. N of Turuk Wau Ekanaku, Rupununi, 350 ft, 6 Nov 1957, *C.D.K. Cook 106* (K, NY, U); Marudi Mountains, Mazoa Hill, near NorMan Mines camp, 300-400 m, 8 Nov 1982, *A.L. Stoffers et al. 213* (B, U, US); Aurora, along track, ± 0.5 km S of

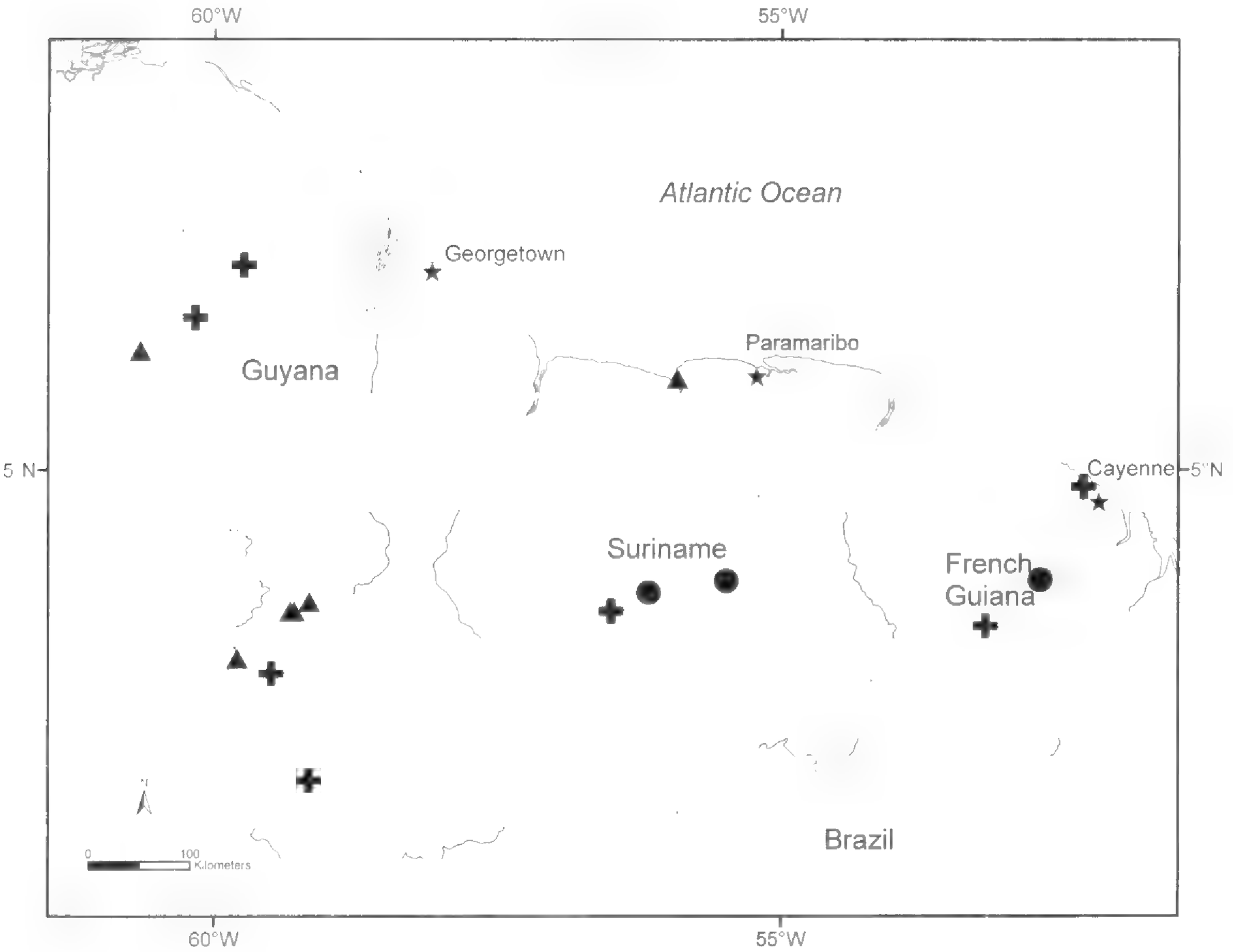

Fig. 34. Distribution of ▲*Rhynchospora pubera* subsp. *pavula*; ●*R. pubisquama*; and ✚*R. radicans* subsp. *microcephala* in the Guianas.

camp, 06°47'30"N, 59°44'30"W, 60 m, 7 Oct 1989, *L.J. Gillespie & S. Tiwari 2168* (NY, US). SURINAME: Wilhelmina Gebergte, 12 Jun 1926, *G. Stahel 495, 7208* (U).

56. Rhynchospora reptans (Rich.) Boeck., Linnaea 37: 531. 1873. *Scirpus reptans* Rich., Actes Soc. Hist. Nat. Paris 1: 106. 1792. *Dichromena reptans* (Rich.) Pers., Syn. Pl. 1: 58. 1805 [as *"Dichroma"*]. *Dichromena repens* (Rich.) Vahl, Enum. Pl. 2: 241. 1805 [orthographic variant]. TYPE: French Guiana, *Domino Le Blond s.n.* (holotype: P). Figs. 35, 75A-B.

Rhynchospora sprucei Boeck., Allg. Bot. Z. Syst. 2: 79. 1896. LECTOTYPE: Brazil; Amazonas, near Panuré on Maupes River, *Spruce 2528* (GH; isolectotypes: B, CGE, NY, P-3), designated by W. W. Thomas, Mem. New York Bot. Gard. 37: 45. 1984.

Stoloniferous perennial, 4-19 cm long; stolons elongate, 0.8-1.5 mm wide; roots fine; sheathing base of culm 3-5 mm wide. Culms ascending to erect, 0.4-0.9 mm wide, slender, soft and flexuous, triquetrous, finely ribbed, green, glabrous, remotely antrorsely scabrous on margins. Leaves 5-12, 4.5-18 cm long, primarily basal and lower cauline, the cauline extending up culm ½ to ⅔ length of culm, ascending and often arching; sheaths eligulate, short, loose, thin and soft, green to pale green proximally, finely veined with pale or whitish veins, essentially glabrous, the inner band membranous, with concave to V-shaped orifice, splitting with age, veined on basal sheaths, the fibrous veins persisting and appearing like trichomes after disentigration of inner band; blades linear to narrowly spatulate, 0.7-4.6 mm wide (unfolded), flattened to often V-shaped or folded, soft, thin and flexuous, finely veined with pale or whitish veins, green to dark green, essentially glabrous, coarsely antrorsely scabrous on margins and adaxial midvein proximally, sometimes remotely so, remotely antrorsely scabrous distally, attenuate to triquetrous, antrorsely scabrous apex. Inflorescence a single obtrigonous to hemispherical head of (1) 3-6 spikelets at the summit of the culm, or sometimes a second contiguous one of 1 or 2 spikelets below, 5-9 × 5-10 mm; involucral bracts 3-5, substantially shorter than the leaves, white adaxially proximally, otherwise green, equaling to five times as long as inflorescence head, the lowermost longest, 1.5-3.5 cm long, 1.7-3.6 mm wide near base; spikelets (1) 3-5 (6), ovoid to ovoid-ellipsoid, obtuse to subacute at apex, broadly short-cuneate at base, subcompressed, 4-7.5 × 1.5-3 (-3.5) mm, scales spreading with maturing achenes; scales 8-34 per spikelet, thin, dorsally acute to obtuse or subrounded with maturing achenes, the upper in a spikelet often curvate-keeled, dull, whitish stramineous to whitish, glabrous, widely scarious distally, midcosta pale green or indistinct, very fine, ending in a short upturned mucro at apex, shorter than acute to obtuse or shallowly emarginate apex; fertile scales 7-32; ovate to oblong-ovate or ovate lanceolate, (2.1-) 2.3-3.4 (3.5) × 1.1-1.7 mm; sterile scales 1 or 2 at base of spikelet, ovate to oblong-ovate, 1.8-3 × 1-1.6 mm. Stamens 3, the anthers 1.3-1.6 mm long, apiculate at apex, truncate and papillate at base; style 2-branched, the branches ⅔ to ½ length of style. Achene biconvex, 0.7-1.1 × 0.8-1.1 mm, widely obovate to widely depressed obovate, widely rounded at apex, shortly cuneate to subrounded at base, papillose to finely transversely rugulose-papillate, stramineous to light brown or brown; epidermal cells isodiametric with coarsely buttressed, conical nodules; style base very shallowly lunate, forming a 0.05-0.2 mm thick brownish ridge extending down along margins of achene to about the middle; bristles absent.

Distribution: South America (Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: Generally found in lowland forests, often forming mats on sand or rocks of creeks, streams, rivers, and pond margins, 10-225 m.

Distinguishing features: See discussion under *Rhynchospora papillosa*.

Specimens examined: FRENCH GUIANA: Region de Saut Macaque, 6.9 Sep 1961, *R. Schnell 11965* (CAY, K, NY, P, U, US); Fleuve Itany, sauts en amont du village indien Antécume Pata, 19 Jul 1972, *C. Sastre 1413* (CAY, P); Saut Tampoc, 7 Aug 1976, *Moretti 608* (CAY); Fleuve Approuague, Rivière Arataye, Saut Pararé, 8 Sep 1977, *C. Sastre 5938* (CAY, P); Rivière Sinnamary à Petit Saut, 12 Feb 1979, *G. Cremers 5370* (CAY, NY, P); Haute Oyapock, creek yeengalali, 6 Sep 1980, *M.F. Prevost & P. Grenand 988* (CAY, NY); Haute Mana, Saut Grand Koumarou, 15 Aug 1981, *J.J. de Granville 4886* (CAY, NY, P, U); Crique Gabaret, Bassin de l'Oyapock, en aval de saut Mérignan, 10 m, 13 Apr 1988, *G. Cremers 9919*

(B, CAY, MO, NY, P, U, US); Saut Takari-Tante, Bassin du Sinnamary, 34 m, 04°37'N, 52°56'W, 14 Nov 1989, *M. Hoff 5820* (NY); Dégrad Pierre, Crique Tigre, Bassin de Sinnamary, 23 m, 04°57'N, 53°12'W, 24 Feb 1990, *M. Hoff 6338* (CAY, NY); Saut Equerre, Bassin du Sinnamary, 60 m, 04°19'N, 52°54'W, 12 Jan 1992, *M. Hoff 7384* (CAY, NY, P); Saut Vata, Bassin du Sinnamary, 7 m, 04°52'N, 52°58'W, 17 Jan 1992, *M. Hoff 7488* (CAY, NY); Saut Patawa, Bassin du Sinnamary, 17 m, 04°46'N, 52°56'W, 17 Jan 1992, *M. Hoff 7514* (CAY); Saut L' Autel, Bassin du Sinnamary, 24 m, 04°42'N, 52°58'W, 16 Jan 1992, *M. Hoff 7567* (CAY); Saut Tigre, Bassin de Sinnamary, 500 m après Saut Tigre, 30 m, 04°58'N, 53°02'W, 22 Oct 1992, *B. Bordenave 351* (CAY, P). GUYANA: Kobanatuk River side, Potaro River, Oct 1898, *G.S. Jenman 7487* (K); Head Falls, Essequibo River basin, 20 Sep 1937, *A.C. Smith 2113* (F, G, K, NY, P, U, US); falls just above Bunawau mouth, Acarai Mountains, 29 Oct 1952, *Forestry Department British Guiana 7524* (NY); Iwokrama Rainforest Reserve, between Pakutan Falls and Ireng Creek on Siparuni River, 04°45'N, 59°01'W, 75 m, 9 Nov 1995, *H.D. Clarke 437* (US); Rewa River, at Great Falls, 03°10'38"N, 58°40'36"W, 90 m, 20 Sep 1997, *H.D. Clarke et al. 6576* (US). SURINAME: Gonini Rivier, 19 Aug 1903, *G.M. Versteeg 155* (U); Riainamo fluv. ripis rep [Suriname River], 11 Jul 1908, *J. Tresling 112* (U); Lucie Rivier, 6 Dec 1910, *J.F. Hulk 397* (U); Sewakervallen, 18 Aug 1923, *G. Stahel 99* (U); Coppename Rivier, Raleigh Vallen, 18 Aug 1923, *B.W. Boschwezen 6256* (K); Boven Suriname Rivier by Goddo, Baloema Dam, 21 Jan 1926, *coll. ign. 32* (U); Boven Gran Rio, Maupé Dam, 20 Feb 1926, *coll. ign. 177* (U); Coppename Rivier, near Raleigh Vallen, 25 Sep 1933, *J. Lanjouw 982* (K, MO, NY, U, US); Saramacca Rivier, Gran Dam, Posoegroenoe, 11 Oct 1944, *B. Maguire 24924* (F, G, K, MO, NY, P,

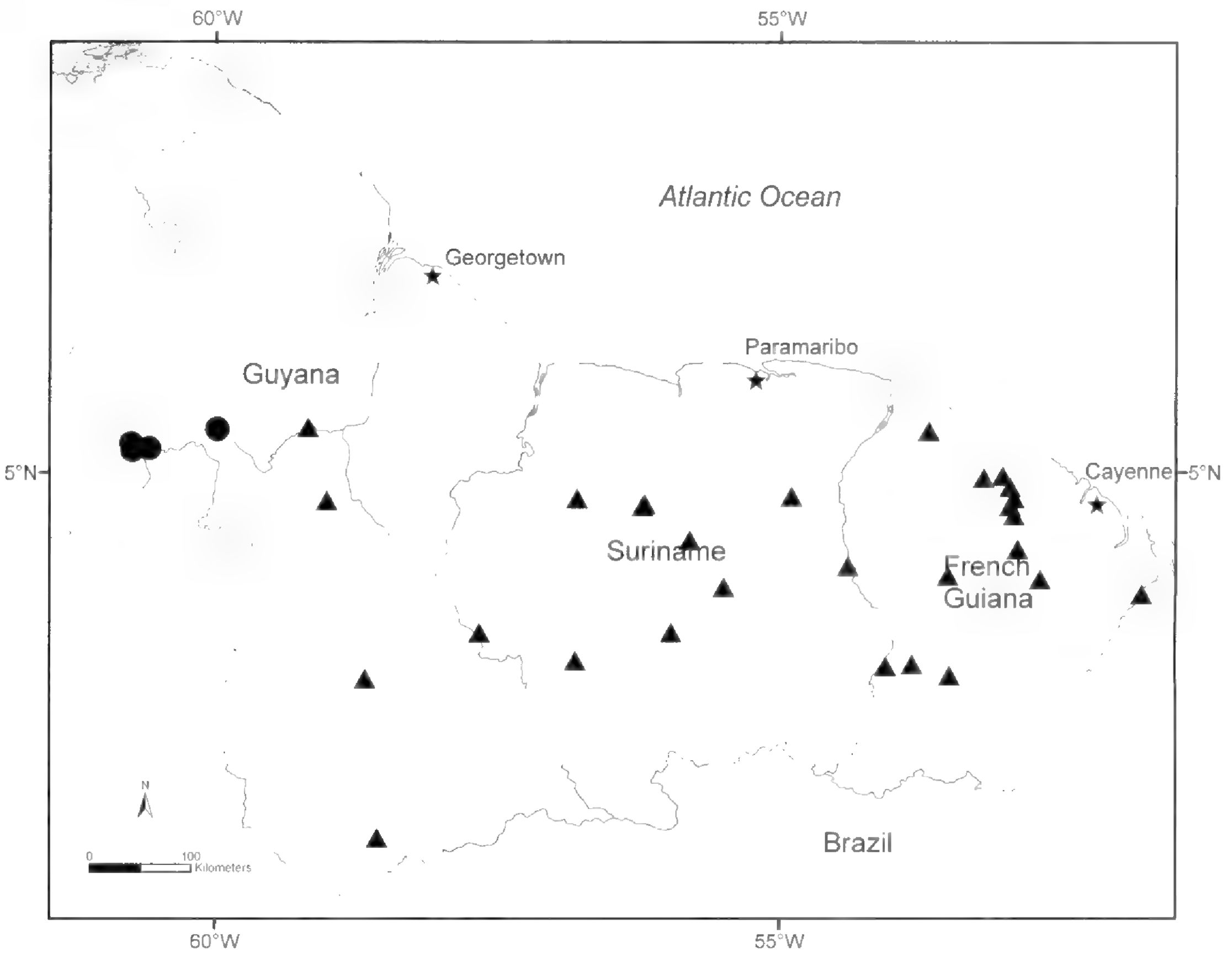

Fig. 35. Distribution of ▲*Rhynchospora reptans* and ●*R. roraimae* in the Guianas.

U, US); Bovenloop, upper Tanjimana Rivier, 20 Nov 1954, *A.M.W. Mennega 475* (C, CAY, MO, U); kreek near Raleigh Falls, 21 Sep 1954, *A.M.W. Mennega 47* (C, CAY, NY, U); Broko kedde val Tanjimama Rivier, 16 Nov 1954, *A.M.W. Mennega 428* (U); Lucie Rivier, 2-5 km below confluence of Oost Rivier, 225 m, 8 Sep 1963, *H.S. Irwin et al. 55499* (NY, US); Upper Suriname Rivier, Kapasi rapids, 19 Feb 1964, *P. Leentvaar s.n.* (F); Upper Suriname Rivier, Kapasi rapids, 19 Feb 1964, *P. Leentvaar vD1001* (U); In montibus Bakhuis inter flum. Kabakebo & Coppename Sinistrum, 1 Feb 1965, *J.C. Lindeman 2700* (NY); in montibus Bakhuis inter flum. Kabalebo and Coppename Sinistrum, basis camp on left Coppename River, 1 Feb 1965, *P.A Florschütz & P.J.M. Maas 2700* (P, U, US); Raleighvallen, Nature Preserve, upstream at "Mother Falls", 3 Oct 1981, *W.W. Thomas 2424* (MO, NY); Raleighvallen, Nature Preserve, upstream at "Mother Falls", 3-4 Oct 1981, *W.W. Thomas 2423* (MO, NY).

57. Rhynchospora riparia (Nees) Boeck., Linnaea 37: 561. 1873. *Haloschoenus riparius* Nees in Martius, Fl. Bras. 2(1): 120. 1842. *Dichromena riparia* (Nees) Steud., Syn. Pl. Glumac. 2: 136. 1855. *Rhynchospora tenuis* subsp. *riparia* (Nees) T. Koyama, Mem. New York Bot. Gard. 23: 78. 1972. TYPE: Brazil, *Pohl 2637* (holotype: W, photo US ex W). Figs. 36, 37, 87A-B.

Dichromena canaliculata Steud., Syn. Pl. Glumac. 2: 136. 1855. *Rhynchospora canaliculata* (Steud.) Boeck., Flora 63: 451. 1880. TYPE: Brazil; Rio de Janeiro, *Glaziou 10132* (holotype: C-Vahl, photo US ex C).

Haloschoenus capillaris var. *congestus* Nees in Martius, Fl. Bras. 2(1): 121. 1842. *Rhynchospora tenuis* var. *congesta* (Nees) Kük., Bot. Jahrb. Syst. 75: 191. 1950. TYPE: Brazil, *coll. ign.* [possibly *Pohl*?] *3619* (holotype: W).

Rhynchospora tenuis var. *maritima* Boeck., Linnaea 37: 612. 1873. TYPE: Brazil; Bahia, *Salzmann s.n.* (holotype: B, destroyed).

Rhynchospora rudioi Boeck., Flora 65: 27. 1882. TYPE: Brazil; Rio de Janeiro, *Rudio s.n.* (holotype: B, destroyed).

Caespitose perennial, 13-40 cm tall; rhizome short; roots coarse, 0.5-1 mm thick, brown; sheathing base of culm 1-3 mm wide. Culms ascending, 0.5-1 (-1.3) mm wide, often trailing and rooting at the nodes, new culms produced at the nodes, these often short, 8-20 cm long, ascending, trigonous with acute to obtuse angles, each side with a deep longitudinal channel medially, firm, finely ribbed, green, glabrous. Leaves numerous, ascending, primarily basal, 1-3 cauline, 8-35 cm long; sheaths eligulate, herbaceous, finely veined, green to pale brown near base, glabrous, inner band membranous, often turning dark brownish black along margins and at orifice with age, the orifice truncate to concave; blades linear to filiform, rarely straight, often wavy, involute to crescentiform-capillary, subtriquetrous distally, 0.5-2.8 mm wide (flattened), soft and subspongy, finely veined abaxially, smooth adaxially, green, glabrous, margins bluntly antrorsely scabrous distally, smooth proximally, the apex flattened-trigonous, attenuate to rounded tip. Inflorescence a terminal and 1 or 2 lateral remote, hemispherical, corymbose partial panicles from the upper leaf-like bracts; bracts 1 (-2) subtending each partial panicle, elongate and typically overtopping panicle; partial panicles (0.5-) 0.7-2 × (0.8-) 1-2.6 cm, the peduncles 0.4-0.6 mm wide, crescentiform to subflattened, remotely and bluntly antrorsely scabrous on margins; panicle branches short, compressed-trigonous to subflattened, remotely antrorsely scabrous on margins; spikelets 6-120 per partial panicle, ovoid-ellipsoid to ovoid-lanceoloid, narrowly acute to acuminate at apex, short-cuneate at base, (4-) 4.5-6.3 × 1.1-2.2 mm, often falcate (curved) at maturity, scales 7-12 per spikelet, spreading with maturing achenes; scales herbaceous, dorsally obtuse to subrounded, smooth, pale green to dark reddish brown, glabrous, margins broadly scarious, midcosta pale brown, indistinct, extending beyond the acute apex as a short minutely antrorsely scabrous mucro; fertile scales 4-8, light brown medially, copiously reddish brown lineolate on sides, ovate-elliptic to ovate-lanceolate, 3-4.5 × 1-2.2 mm, the distal scales submembranous, subcoriaceous medially; sterile scales 3 or 4, ovate, subcoriaceous, pale green, reddish brown lineolate on sides near margin, 1.3-2.5 × 0.7-1.6 mm. Stamens 3, the anthers 1.4-2.2 mm long, apiculate at apex, short-sagittate (2-lobed) at base; style distinctly 2-branched, about same length as unbranched portion. Achene biconvex, obovate, 0.7-1 × 0.7-1.1 mm, with 2 oval to rounded protuberances on

either side of base, truncate at apex, transversely rugose, pale brown to dark red, the margins pale brown, wire-like; epidermal cells linear, vertically oriented; style base trigonoform in general, 2-lobed like a mustache, 0.3-0.5 mm long, 0.6-0.8 mm wide at base, light brown to brown-black; bristles absent.

Distribution: South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil and Argentina).

Habitat in the Guianas: Wet to moist sand savanna (often on white-sands) and sandy river or stream beds and flats; in depressions, edges of lakes, ponds, pools, creeks, and streams, seepages, swampy areas, 0-575 m.

Distinguishing features: The two oval to rounded cellular protuberances on either side of the achene base readily distinguish this species from all other species of *R.* section *Tenues*. Other characteristics distinguish *R. riparia* from *R. tenuis* with which it has been confused, most notably its habit of often trailing and rooting at the nodes and spikelet scales which are copiously reddish brown lineolate on their sides.

Specimens examined: FRENCH GUIANA: Cayenne, without date, *H.C. Rothery s.n.* (BM); Cayenne, 1844, *H.C. Rothery s.n.* (US); Cayenne, 16 Feb 1845, *H.C. Rothery 189* (K); Cayenne, 6 May 1845, *H.C. Rothery s.n.* (BM, US); Route de Sinamary, entre 10 et 11 km, 3 May 1957, *J.J. Hoock s.n.* (P); Route de Sinamary, Grandes Savanes de Kourou, 3 May 1957, *J.J. Hoock s.n.* (P); Without locality, 12 Feb 1962, *J.J. Hoock s.n.* (U); Pariacabo, sables blanco, 13 Feb 1962, *J.J. Hoock s.n.* (K, NY, U). Savane Bordelaise, route du tour de Iîle, SO. Cayenne, 10 Mar 1977, *G. Cremers & Y. Veyret* 4435 (CAY, FTG, NY); Savane Bordelaise, route du tour de L'île, SO. Cayenne, 25 Feb 1977, *G. Cremers & Y. Veyret 4372* (CAY, FTG, NY, P); Savane de Corossony, sur la piste de St. Elie, 4 à 7 km à l'WSW de Sinnamary, 4 Jan 1978, *A. Raynal-Roques 19754* (CAY, P); Savane Bordelaise, 5 Feb 1978, *J.J. de Granville 2843* (CAY, NY, P, U); 30 km ESE de Mana, 13 Mar 1978, *A. Raynal-Roques 20204* (CAY, P); 5 km après Sinnamary, Savane de Corossony, 13 Aug 1982, *A. Fournet 266* (CAY, P); Savane de Corossony, Piste de St.-Elie, 05°23'N, 53°00'W, 27 Dec 1986, *C. Feuillet 4043* (CAY, NY, P, U). GUYANA: Ituribisci Lake, Aug 1886, *G.S. Jenman 2220* (BM, K); Kamakusa, Upper Mazaruni River, 11-22 Jul 1923, *J.S. de la Cruz 4250* (F, K, MO-2, NY, US); Mazaruni Station, near Mazaruni River, 50 ft, 14 May 1933, Cambridge University Expedition 1933, *T.G. Tutin 90* (K, NY, U, US); Mazaruni Station, 14 Aug 1937, KEW Expedition to British Guiana 1937, *N.Y. Sandwith1071* (K, U); Kaieteur savanna, 1200 ft, 7 Sep 1937, *N.Y. Sandwith 1419* (K, NY, U); H.M. Penal Settlement, Mazaruni, 1939, *D.B. Fanshawe 218* (K); H.M. Penal Settlement, Mazaruni, 1939, *D.B. Fanshawe 174* (K); Kaieteur Plateau, Potaro River, 2 May 1944, *B. Maguire & D.B. Fanshawe 23168* (US); Kaieteur savanna, 05°11'N, 59°30'W, 2 May 1944, *B. Maguire & D.B. Fanshawe 23163* (F, K, MO, NY, U, US); bordering Mahaica Savannah, 10 mi. E of Atkinson Field, 20 Apr 1954, *H.S. Irwin 220* (US); Ponds 20 mi S of Lethem on road to Wichabi, 26 Feb 1957, *C.D.K. Cook 222b* (U); Ponds 20 mi S of Lethem on road to Wichabi, 26 Nov 1957, *C.D.K. Cook 222*a (K, NY); ponds 20 mi S of Lethem, on road to Wichabi, Rupununi District, 26 Nov 1957, *C.D.K. Cook 222* (K, U); Ebini Experimental Station, Berbice River, 3 Apr 1958, *S.G. Harrison 727* (K); Lethem, 24 Jul 1958, *S.G. Harrison 1358* (K); Annai savanna, Rupununi, 6 Jan 1961, V. Graham 496 (K); Rupununi Northern Savanna, 2 mi. S of St. Ignatius, near Takutu, 350 ft, 5 Aug 1963, *R.J.A. Goodland 296* (NY, US); 10.5 mi S of St. Ignatius, 20 Sep 1963, *R.J.A. Goodland 857* (NY); Ebini, Berbice, 29 Oct 1963, *R.J.A. Goodland & R. Persaud 1092* (NY); Atkinson, St. Cuthbert's trail, 4.5 mi from highway, 12 Jan 1969, *U.G. Bio. 106 36* (K, NY); Waranama, Berbice, Oct 1973, *A. Cooper 91* (U); Rupununi District, Manari, 22 Oct 1979, *P.J.M. Maas et al. 3738* (F, K, MO, NY, U); creek 2 mi S of Araquoi, 300 ft, 2 Nov 1987, *C.D.K. Cook 93* (K, NY, U); Kaieteur Falls National Park, near airstrip, 05°11'N, 59°30'W, 500 m, 2 Apr 1988, *W.E. Hahn et al. 4123* (US); Rupununi River, Monkey Pond landing, SW of Mt. Makarapan, 10 Sep 1988, *P.J.M. Maas et al. 7348* (B, U, US); Mainstay Lake, 07°15'N, 58°32'W, 0-10 m, 21 Apr 1989, *L.J. Gillespie & H. Persaud 1098* (CAY, NY, U, US); South Rupununi savanna, Dadanawa, 02°50'N, 59°31'W, 100-120 m, 17 Jun 1989, *L.J. Gillespie et al. 1635* (MO, NY, U, US); Pakaraima Mountains, upper Mazaruni River, 4.5-5.5 km S Imbaimadai settlement, 05°39'N, 60°17'W, 525-575 m, 11 Oct 1992, *B. Hoffman et al. 2856* (NY, US); artificial lake near Karanambo Ranch, Rupununi Savanna, 03°45'N, 59°19'W, 100-250 m, 21 Nov 1992, *A.R.A. Görts-van Rijn et al. 380* (US); Manari, 80 m, 12 Jul 1995, *M.J. Jansen-*

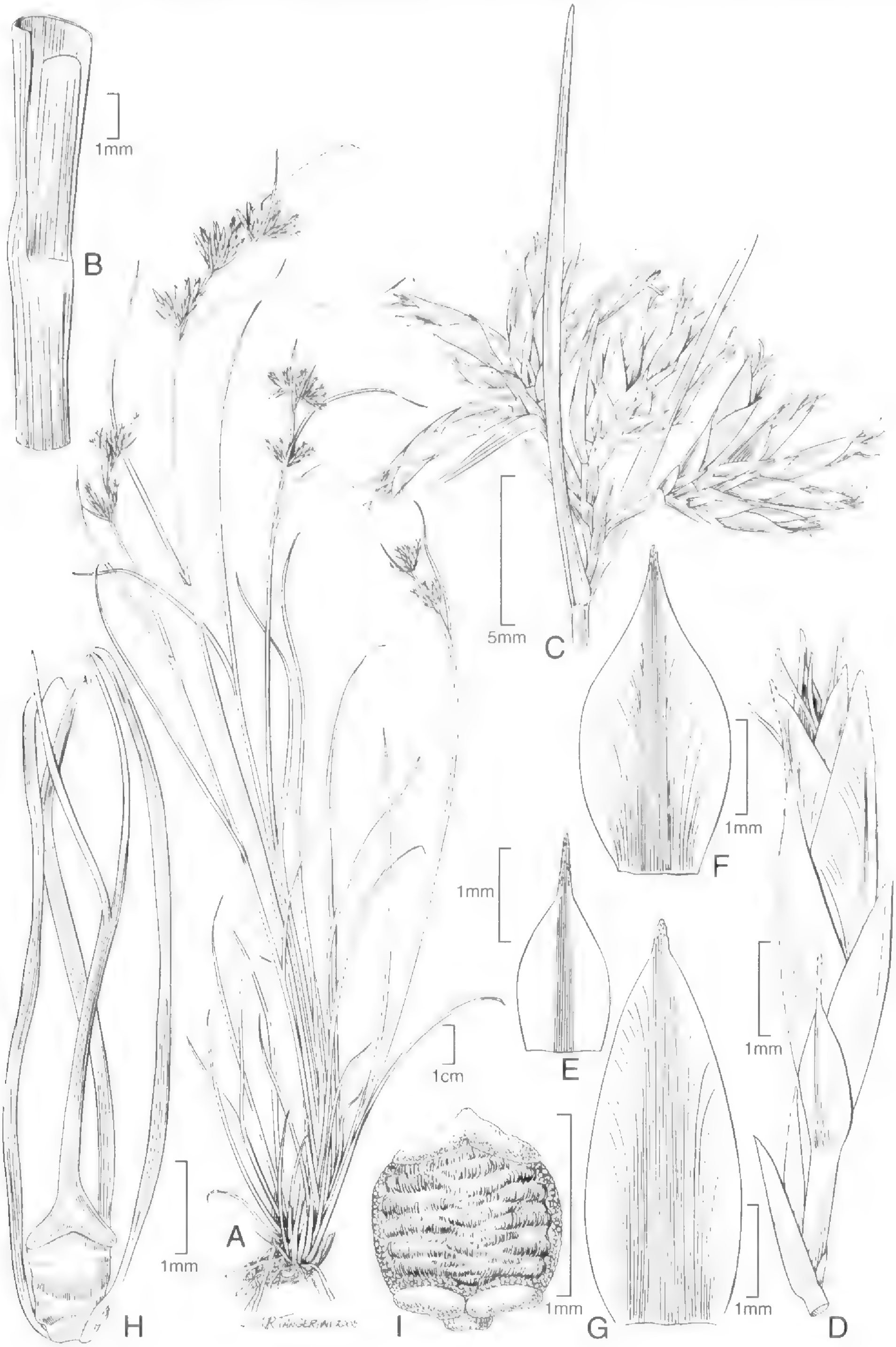

Fig. 36. *Rhynchospora riparia.* A. Habit. B. Section of culm showing junction of leaf sheath and blade. C. Terminal inflorescence panicle. D. Spikelet with pedicel showing bracts at base. E. Lower sterile spikelet scale. F, G. Fertile spikelet scales. H. Floret showing filaments, 2-branched style, and immature achene. I. Achene. (A-H, from *Tutin 90*, US; I, from *Goodland 296*, US).

Jacobs et al. 4420 (U, US);Dadanawa, southern Rupununi Savanna, E side of Rupununi River, 02°50'N, 59°25'W, 110-120 m, 21 Aug 1995, *S.R. Hill et al. 27344* (US); Rupununi Northern Savanna, Runway Pond, about 3 mi. NW of Karanambo, 03°45'N, 59°10'W, 80 m, 21 Oct 1996, *C.N. Horn & J. Wiersema 11026* (US); Rupununi Northern Savanna, along Pirara River at bridge just N of ranch at Pirara, 03°20'N, 59°50'W, 80 m, 19 Oct 1996, *C.N. Horn & J. Wiersema 11002* (US); Kaieteur National Park, above Falls, 05°10'44"N, 59°28'48"W, 260 m, 15 Jun 1998, *C.L. Kelloff 1373* (US). SURINAME: Without locality or date, *M. Weigelt s.n.* (BM); Zanderij I, 7 Oct 1910, *I. Boldingh 3843* (U); Zanderij I, Aug 1914, *E. Essed 95* (K, NY, U, US); Zanderij I, Airfield, Oct 1941, *G. Stahel 144* (NY, U, US); Zanderij II, 25 Jan 1942, *G. Stahel s.n.* (NY, U); Zanderij II, 3 Jun 1944, *B. Maguire & G. Stahel 23670* (NY); Tafelberg (Table Mountain), Savanna no. II, 565 m, 7 Aug 1944, *B. Maguire 24251a* (F, K, NY, U, US); Zanderij II, 19 Oct 1944, *B. Maguire & G. Stahel 25030* (F, K, MO, NY, P, U, US); Zanderij, 26 Feb 1946, *L.B.H. 163* (NY); Zanderij I, 9 Sep 1948, *J. Lanjouw & J.C. Lindeman 226a* (U); Zanderij II, 16 Mar 1949, *J. Lanjouw & J.C. Lindeman 3301* (U); Grote Sapende, 8 Feb 1949, *D. Heinsdijk H44* (NY, U); Jodensavanne, 12 Apr 1949, *J. Lanjouw & J.C. Lindeman 2989* (K, NY, U); Zanderij, 22 Dec 1950, *J. Florschütz & P.A. Florschütz 808* (NY, U); Matta Savanne, 28 Jul 1952, *Ir J.G.P. Dirven LP274* (U); Upper Commewijne Rivier, near Sapende, 14 Jul 1953, *J.C. Lindeman 4231* (F, U); between Zanderij and Matta, 24 Aug 1954, *J.C. Lindeman 6502* (U); Zanderij and Matta, 26 Aug 1954, *J.C. Lindeman 6527* (U); Boven Coesewijne, 16 May 1956, *P.C. Heyligers 8* (U); Sabanpassie, on Brink Heuvel, 31 Jul 1956, *P.C. Heyligers 161* (U); Langs spoorbann op sand savanna, 19 Mar 1956, *Ir J.G.P. Dirven LP593* (U); Langs spoorbann op sand savanna, 19 Mar 1956, *Ir J.G.P. Dirven LP589* (U); Gros Savanne (prope km 103), 4 Apr 1959, *J. van Donselaar 688* (MO); Gros Savanne, prope km 103, on railway, opn 312, 8 Apr 1959, *J. van Donselaar 700* (U); Zanderij I, 28 Apr 1959, *W.A.E. van Donselaar DC4* (U); Zanderij I, 30 Apr 1959, *W.A.E. van Donselaar DC11* (U); Lobin-savanna inter Zanderij I and Hannover, 19 Sep 1959, *J. van Donselaar & W.A.E. van Donselaar 150* (U); Jodensavanne-Mapane Kreek area, 16 Jan 1961, *K.U. Kramer & W.H.A. Hekking 2659* (U); Zanderij, District Suriname, 24 Sep 1961, *W.H.A. Hekking 1033* (U); Jodensavanne-Mapane Kreek area, Aug 1962, *J.H.A. Boerboom 9553* (U); Jodensavanne-Mapane Kreek area (Suriname Rivier), Aboma Kreek, near km 4, 20 Dec 1963, *J.C. Lindeman 9932* (US); Aboma Kreek, 4 km v Jodensavanne, 20 Dec 1963, *J.P. Schulz LBB9932* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 2 Sep 1967, *J.T. Wildschut & P.A. Teunissen 11601* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 15 Jan 1968, *P.A. Teunissen & J.T. Wildschut LBB11440* (U); Zanderij, near LBB, 3 May 1976, *R. Jansma LBB15558* (U); Singri Lanti, W of Remark (Zanderij), Aug 1976, *R. Jansma LBB15901* (U); Zanderij Savanne, SE of airport, 30 Sep 1979, *W.W. Thomas 2415* (NY); Zanderij Savanne, 30 Sep 1979, *W.W. Thomas 2411* (NY); Hanover, 2.5 km E of Paramaribo-airport road, 29 Sep 1979, *W.W. Thomas 2385* (NY); Experimental farm Coebiti, 4 Feb 1982, *A.P. Everaarts 620* (U); Experimental farm Coebiti, 7 Jul 1982, *A.P. Everaarts 669* (U); Experimental farm Coebiti, 18 Jan 1984, *A.P. Everaarts 900* (U); Experimental farm Kabo, 26 Jan 1984, *A.P. Everaarts 908* (U); Experimental farm Kabo, 25 Jul 1984, *A.P. Everaarts 1077* (U); Zanderij, near J. Starke Opleidingscentrum, 3 Apr 1986, *H. Viane 1181* (MO).

58. Rhynchospora roraimae Kük., Bot. Jahrb. Syst. 56: 19. 1921. TYPE: Venezuela; "Au Bathes auf dem gipfel des Roraima", Dec. 1909, *Ule 8542* (holotype: B!; isotypes: US!, G, photo US ex G). Figs. 35, 83A-B.

Rhizomatous perennial, 3-16 cm tall, from a short knotty rhizome, often forming basal offshoots; roots fine to medium, 0.3-0.5 mm in diam. Culms ascending, 0.2-0.4 mm wide, filiform, obtusely trigonous to subterete, soft, very finely ribbed, green to pale green, glabrous, often shorter than and hidden among the leaves, the longer ones slightly exceeding apex of leaves. Leaves ascending, 3-12 per culm, primarily basal, 1-3 lower cauline, 1.8-12 cm long; sheaths eligulate, short, coarsely veined, pale brown to brown, glabrous, the inner band membranous, purple-dotted, often dark brown to blackish distally on lower basal sheaths, with a truncate to concave orifice; blades filiform, crescentiform-capillary to

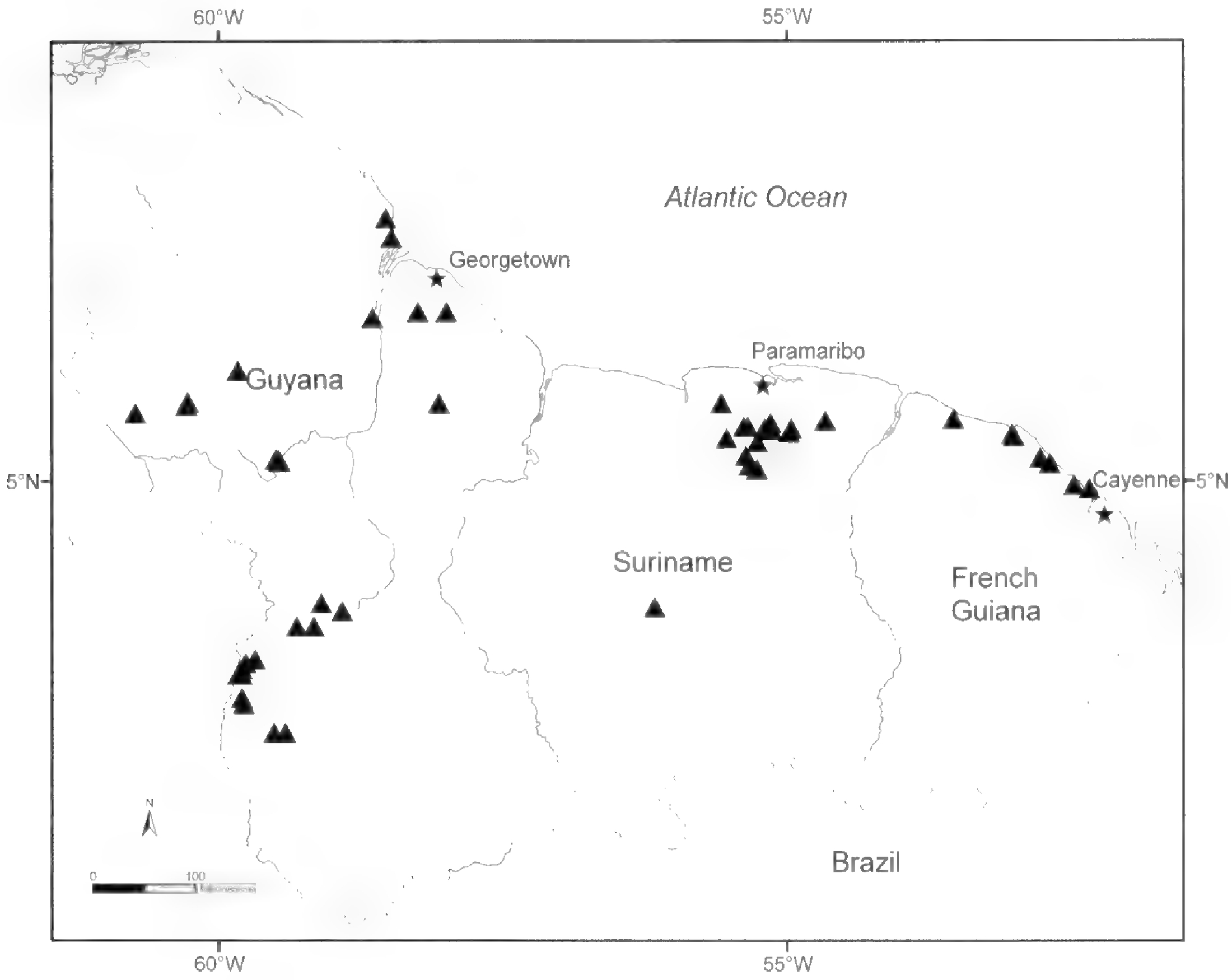

Fig. 37. Distribution of *Rhynchospora riparia* in the Guianas.

subterete, crescentiform-channeled in cross section proximally, compressed distally, 0.2-0.4 mm wide, soft, finely veined, smooth, green, glabrous, articulated and abruptly flattened 3-10 mm from the rounded tip, with minute crystalline pustulate-based prickles along the margins. Inflorescence a small terminal panicle of (1-) 2 (-3) spikelets and often a remote second partial inflorescence below, often consisting of only a single spikelet, from the upper leaf-like bracts; bracts longer than and often greatly overtopping spikelets, 1-5 cm × 0.2-0.3 mm; spikelet pedicels flattened (2-sided), smooth to scabrous on margins; spikelets ellipsoid, subterete in cross section, narrowly acute to acuminate at apex, cuneate at base, 4-7 × 0.9-1.4 mm; scales 8-14 per spikelet, lower sterile and fertile scales subcoriaceous to herbaceous, upper fertile scales herbaceous to membranous, smooth, brown with dark brown sides, glabrous, subglossy, margins entire, midcosta indistinct proximally, distinct at apex, prolonged as a short mucro beyond the acute to shortly acuminate apex; fertile scales 5-8, ovate-elliptic to ovate-lanceolate, 3-4.5 × (1-) 1.3-2.2 (-2.4) mm; sterile scales 3-6, ovate to ovate-elliptic, 1-2.5 × 0.8-1.8 mm. Stamens 3, the anthers 0.9-1.5 mm long, with minute papillae at both base and apex; style 2-branched, the branches about same length as unbranched portion, exserted beyond apex of subtending scale. Achene biconvex, narrowly obovate, 1-1.4 × 0.7-1 mm, with rounded-cuneate cellular-reticulate base and broadly acute to subtruncate apex, indistinctly transversely rugose to essentiall smooth, semi-glossy to glossy, light yellowish brown to light brown; epidermal cells rectangular to linear, vertically oriented; style base triangular with acute to shortly acuminate apex, shallowly 2-lobed at base, 0.3-0.8 mm long, 0.5-0.8 mm wide at base, thin, brittle, brown; bristles absent.

Distribution: Endemic to the Guayana Shield

(Venezuela, Guyana, and perhaps Brazil).

Habitat in the Guianas: On tepui summits in wet or marshy meadows, bogs, and openings in shrub thickets, 1800-2400 m.

Specimens examined: GUYANA: Mt. Roraima, Dec 1909, *E. Ule 8542* (B, K); Mt. Roraima, 7600 ft, 1 Nov 1973, *R. Persaud 146* (K); Mt. Roraima, N ridge escarpment, 6200-6500 ft, 05°15'40"N, 60°44'40"W, 23-30 Mar 1978, *P.J. Edwards 114* (K); Pakaraima Mountains, 2 km transect along summit ridge, Mt. Ayanganna, 05°23'N, 59°59'W, 1800-2000 m, 3 Nov 1992, *T.W. Henkel & B. Hoffman 115* (US); Mt. Ayanganna, camp on summit plateau, 05°23'18"N, 59°59'08"W, 2040 m, 23 Jun 2001, *H.D. Clarke et al. 9502* (US); Mt. Maringma, summit, 05°13'0.7"N, 60°35'2.7"W, 2110 m, 17 June 2004, *H.D. Clarke et al. 11767* (US).

59. Rhynchospora rugosa (Vahl) Gale, Rhodora 46: 275. 1944. *Schoenus rugosus* Vahl, Eclog. Amer. 2:5. 1798. *Rhynchospora glauca* Vahl, Enum. Pl. 2: 233. 1805, *nom. illeg.* TYPE: South America; Boca Chica, *von Rohr 27* (holotype: C-Vahl, photo US ex C). Figs. 38, 67A-B.

Rhynchospora pungens Liebm., Kongel. Danske Vidensk. Selsk. Skr., Naturvidensk. Math. Afd., Ser. 5. 2 (Mexic. Halvgr.): 253-254. 1849. TYPE: Mexico; Veracruz, "Voxer i törre Savaner omkring Mirador...", *Liebmann s.n.* (holotype: C; isotypes: GH, K, P).

Rhynchospora laevigata Steud., Syn. Pl. Glumac. 2: 145. 1855. TYPE: French Guiana, *Martin 44* (holotype: P).

Caespitose perennial, 27-135 (-140) cm tall; rhizome short, knotty; roots coarse. Culms erect, (0.8-) 1.2-2.5 (-3) mm wide, trigonous to obtusely trigonous, very firm, finely ribbed and channeled, smooth, glabrous. Leaves 5-15, primarily basal, 2-5 cauline, 9-55 cm long; sheaths eligulate, short, finely ribbed, smooth, green, glabrous, the inner band membranous on basal blades, minutely red-speckled, with truncate orifice, the upper and cauline sheaths membranous only distally and bear a truncate to concave orifice; blades (1.3-) 1.7-4.5 (-5) mm wide, flattened to subplicate or folded, smooth, green, glabrous, margins and midvein abaxially smooth proximally to minutely antrorsely scabrous distally, long-acuminate to triquetrous apex. Inflorescence a terminal and 1 or 2 lateral, remote cymose-paniculate partial panicles from the upper leaf-like bracts; bracts 1 (-2) subtending each partial panicle, those of the lowermost panicles equaling to often exceeding the apex of subtending panicle, those of the terminal panicle shorter than to equaling apex of panicle, rarely exceeding it; partial panicles 1-8 (-11) × 0.8-2.7 (-3.5) cm; peduncles of lower partial panicles flexuous, 1-6 cm × 0.5-0.7 mm, trigonous to compressed-trigonous or subflattened, finely ribbed, smooth to scabrous on margins distally; panicle branches short, trigonous to compressed-trigonous in cross section, smooth on margins, the spikelets in fascicles at branch tips; spikelets ovoid-ellipsoid, acute at apex, short-cuneate at base, 3.5-4.7 (-5) × 1.1-1.7 mm, spreading with developing achenes; scales 6-9 per spikelet, thinly herbaceous, dorsally obtuse to subrounded, brown to dark brown or brownish black, glabrous, indistinctly finely veined, margins broadly scarious, often erose, midcosta narrow, pale brown, extending beyond acuminate apex as a 0.1-0.5 mm long mucro; fertile scales 3-5, ovate to oblong-ovate, (2.3-) 2.5-3.5 × 1.8-2.8 mm; sterile scales 3 or 4, ovate, 1.5-2.2 × 0.7-1.5 mm. Stamens 3, the anthers 0.6-1.7 mm long, apiculate at apex, truncate and minutely lobed at base; style 2-branched, the branches twice as long as unbranched portion, exceeding the scales and curling. Achene biconvex, obovate to elliptic-obovate, 1.6-1.9 × 1-1.3 mm, cuneate at base, truncate at apex, transversely rugulose, light brown or yellowish brown; epidermal cells rectangular to linear, vertically oriented; style base triangular, 0.6-1 mm long, 0.6-0.8 (-1) mm wide at base, about $^2/_3$ as wide as achene, minutely antrorsely scabrous along margin, pale brown to dark brown; bristles 6, antrorsely barbed, equaling to exceeding apex of style base, often setose at base.

Distribution: Southern Mexico, Central America (Guatemala, Honduras, Nicaragua, Costa Rica, and Panama), Greater Antilles (Cuba, Hispaniola, Jamaica, Puerto Rico), Lesser Antilles, Trinidad, and South America (Venezuela, Guyana, Suriname, French Guiana, southeastern Brazil, Peru, Bolivia, Paraguay, and Argentina).

Habitat in the Guianas: Sand and sandy clay savanna, forest edges, stream and brook margins, swamp forest, wet depressions, pond margins, early successional areas, roadsides, and waste areas, 5-575 m.

Specimens examined: FRENCH GUIANA: Cayenne, without date, *J. Martin 40* (P); Cayenne, without date, *J. Martin 326* (BM); Without locality,

1819-1821, *M. Poiteau s.n.* (G); Without locality, 1824, *M. Poiteau s.n.* (K); Without locality, 1834, *M. Leprieur 88* (G, P-2); Cayenne, 1835, *M. Leprieur s.n.* (G); Cayenne, 1836, *M. Leprieur 229* (K, P-2); Without locality,1838, *M. Leprieur s.n.* (P-2); Without locality, 1840, *M. Leprieur s.n.* (G); Cayenne, Mar 1859, *P. Sagot 1386* (BM, K, P); Route "de l'Est", env. 3 km au N du pont sur la Rivière Comté (38 km au S de Cayenne), 10 Jan 1978, *A. Raynal-Roques 19808* (CAY, P); Regina, 23 Nov 1978, *C. Sastre* 6361 (U); Savane de Corossony, sur la piste de St. Elie; 4 à 7 km à l'WSW de Sinnamary, 5 Jan 1978, *A. Raynal-Roques 19764* (CAY, P), *19766* (CAY); Verger I.F.A.C., 20 km de Ste. Laurent, ancienne route de Cayenne, 16 Dec 1978, *C. Sastre 6421* (CAY); Dégrad Fourgassié, sur la Rivière Orapu (affluent de la Rivière Comté), rive droite, 5 km en amont du confluence, 12 Feb 1978, *A. Raynal-Roques 20033* (CAY, P); Bord de la piste de St. Elie, km 16.3, 21 Mar 1979, *M.F. Prevost 464* (P, U); Village Arawak de Ste Rose de Lima (Commune de Matoury), 10 Dec 1980, *A. Gely 131* (CAY); Cayenne, route du Tour de l'Ile, PK 11, 2 Aug 1982, *A. Fournet 235* (CAY, P); Est de Cayenne, route de Regina, 1 km après le pont sur la comté, près d'une mare, 9 Aug 1982, *A. Fournet 255* (CAY, P); RN 1, 6 km après Sinnamary, Savane de Corossony, 13 Aug 1982, *A. Fournet 271* (CAY, P); Route de Paul Isnard à St. Laurent, à 44 km de Citron, 15 Nov 1982, *A. Fournet 334* (CAY, P); Région du Gallion, Piste récente, 21 Dec 1985, *J.J. de Granville 8295* (CAY, NY, P, U); Ile de Cayenne, route du Tour, D 5 au PK 30-30, 3 Apr 1986, *G. Cremers 9437* (B, CAY, NY, P, U, US); Cayenne, Montagne de Kaw, PK 45.5, 15 Mar 1987, *G. Cremers 9607* (CAY, MO, NY, P, U, US); Along main road through Montagnes de Kaw, at end of road, 04°35'N, 52°15'W, 140 m, 13 Sep 1987, *A. Weitzman & W. Hahn 317* (B, CAY, F, P, U, US); Loulette, Bassin de la Basse-Mana, 15 Apr 1989, *G. Cremers & M. Hoff 10615* (CAY, MO, NY, P, U, US); Piste du Village Eskol, Montagne de Kaw, 5 m, 05°43'N, 52°17'W, 16 Sep 1992, *A. LeGoff & M. Hoff 215* (CAY); Piste de Saint-Elie, 05°20'N, 53°00'W, 27 Apr 1994, *S. Albertini 42* (CAY); Piste de Saint-Elie, 27 Apr 1994, *S. Albertini 12* (CAY); Savane Malmanoury 2, 14 Feb 1995, *L. Cadamuro & Solacroup 251* (CAY); Savane Malmanoury 2, 14 Feb 1995, *L. Cadamuro & Solacroup 249* (CAY). GUYANA: Mt. Roraima, 'Our House', 15 Dec 1884, *G.S. Jenman 245* (US); Mt. Roraima, Our House, 05°12'N, 60°44'W, Dec 1884, *E.F. im Thurn 245* (BM, K, US); Lama Savanna, Apr 1889, *G.S. Jenman 6127, 6128* (K); SE of Georgetown, East Coast Water Conservancy, Lamaha Stop-Off, 28 Nov 1919, *A.S. Hitchcock 17022* (US); Isherton, Rupununi District, 1933, *Boundary Commission 261* (K); Isherton, 1933, *Herbarium 261* (K); Ebini Experimental Station, Berbice River, 12 Apr 1958, *S.G. Harrison 838* (K); Gunn's, Essequibo River, 240-260 m, 3 Sep 1989, *M.J. Jansen-Jacobs et al. 1431* (B, F, K, P, U, US); Camp along Waruma River, ± 2 km upstream of confluence with Kako River, 05°20'N, 60°43'45"W, 600 m, 10 Feb 1989, *W. Hahn & D. Gopaul 5251* (US); Pakaraima Mountains, 0.5 km NW of Imbaimadai settlement, 05°42'N, 60°17'W, 525-575 m, 17 Nov 1992, *B. Hoffman 3423* (US); Rupununi Northern Savanna, Mackiedon Dam, just S of large airstrip, 3 mi. NW of Karanambo, 03°45'N, 59°10'W, 80 m, 22 Oct 1996, *C.N. Horn & J. Wiersema 11063* (US); Gunn's Strip, airstrip 2 km W of village & Essequibo River, 01°39'05"N, 58°38'50"W, 240 m, 18 Sep 1998, *H.D. Clarke et al. 7877* (US). SURINAME: Without locality or date, *coll. ign. s.n.* (BM); Onoribo, 1835?, *H.C. Focke 908* (U); Apikollo, 29 Jan 1911, *J.F. Hulk 76* (U); Zanderij I, Sep 1914, *E. Essed 74* (U); Near Brownsweg, 13 Nov 1933, *J. Lanjouw 1264* (K, MO, U); Boven-Sipaliwini, Camp 4, 02°00'N, 56°00'W, 24 Oct 1935, *H.E. Rombouts 235* (U); near Vier Kinderen, 5 Sep 1948, *J. Lanjouw & J.C. Lindeman 180, 199* (K, U); Langs spoorlijn bij km 114.5 [between km 72 and Kabelstation], 23 Apr 1949, *J. Lanjouw & J.C. Lindeman 3054* (U); Maratakka Rivier, 8 Apr 1951, *J. Florschütz & P.A. Florschütz 2005* (U); Kasiwinika (Cassewinica) Kreek, near Kopie, 15 Jul 1953, *J.C. Lindeman 4304a* (U); Ten Noorden van Berlijn, 28 May 1956, *P.C. Heyligers 58* (U); Ten Noorden van Berlijn, 28 May 1956, *P.C. Heyligers 81* (U); Berceba opname 147, 8 Nov 1958, *J. van Donselaar 233* (U); Lobin-savanna inter Zanderij I and Hannover, opname 71, 26 Sep 1958, *J. van Donselaar & W.A.E. van Donselaar 149* (U); Lobin-savanna inter Zanderij I and Hannover, 9 May 1959, *W.A.E van Donselaar DC17* (U); Coesewijne Savanne, opn 257, 2 Feb 1959, *J. van Donselaar 570* (U); Gros Savanne (prope km 103), opn. 315, in maurisiekreekdal, 9 Apr 1959, *J. van Donselaar 710* (U); Pad van Wanica, 2 Oct 1959, *Ir J.G.P. Dirven 719* (U); Zuid Rivier, S of Kayser airstrip, 45 km above conflucence with Lucie Rivier, 270

m, 22 Sep 1963, *H.S. Irwin et al. 55957* (US); Zuid Rivier, savanna bij Kayser-vliegveld, 13 Aug 1963, *J.P. Schulz LBB10435* (U); Sipaliwini Airstrip, Upper Sipaliwini Rivier, 19 Feb 1963, *J.G. Wessels Boer 692* (U); 2 km N of Lucie Rivier, 2 km W of Oost Rivier, 225 m, 28 Jul 1963, *H.S. Irwin et al. 54479* (US); S of Kayser Airstrip, Zuid Rivier, 45 km above confluence with Lucie Rivier, 270 m, 22 Sep 1963, *H.S. Irwin et al. 54479* (US); Maratakka Rivier, Saparra Kreek Savanne, 10 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3252* (U); Maratakka Rivier, Saparra Kreek Savanne, 28 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3352* (U); Sipaliwini Savanne, 25 Aug 1966, *J. van Donselaar 3575* (U); Sipaliwini Savanne area on Brazilian frontier, 30 Dec 1968, *F.H.F. Oldenburger et al 730* (U); Sipaliwini Savanne area on Brazilian frontier, E of small savanne near brook, 24 Jan 1969, *F.H.F. Oldenburger et al. 836* (U); Coesewijne Savanne, 31 Mar 1976, *P.A. Teunissen LBB15486* (U); Along road between Berg en Dal and Brownsweg, 5 km N of railroad tracks in Brownsweg, 150 m, 05°03'N, 05508'W, 10 Jul 1982, *T.B. Croat 53882* (MO); Experimental farm Kabo, 1 Sep 1984, *A.P. Everaarts 1201* (U); Experimental farm Kabo, 21 Jun 1984, *A.P. Everaarts 980* (U).

60. Rhynchospora rupicola M. T. Strong, Novon 11: 270. 2001. TYPE: Suriname; In montibus, qui dicuntur Emmaketen, rock savanna on S side of top, SW of Grote Hendriktop, ca. 935 m., 20 Aug. 1959, A. *Daniëls & F. Jonker 998* (holotype: U sheet #276785; isotype: US). Figs. 39, 40, 79C-D.

Slender perennial, 40-70 cm tall; rhizome short, the culms borne singly or sometimes 2 or 3 together from nodes of the rhizome; sheathing base of culm 4-6 mm wide; roots fibrous. Culms slender, ascending, 1-1.3 mm wide, trigonous, with concave sides, finely ribbed, smooth, green, glabrous except

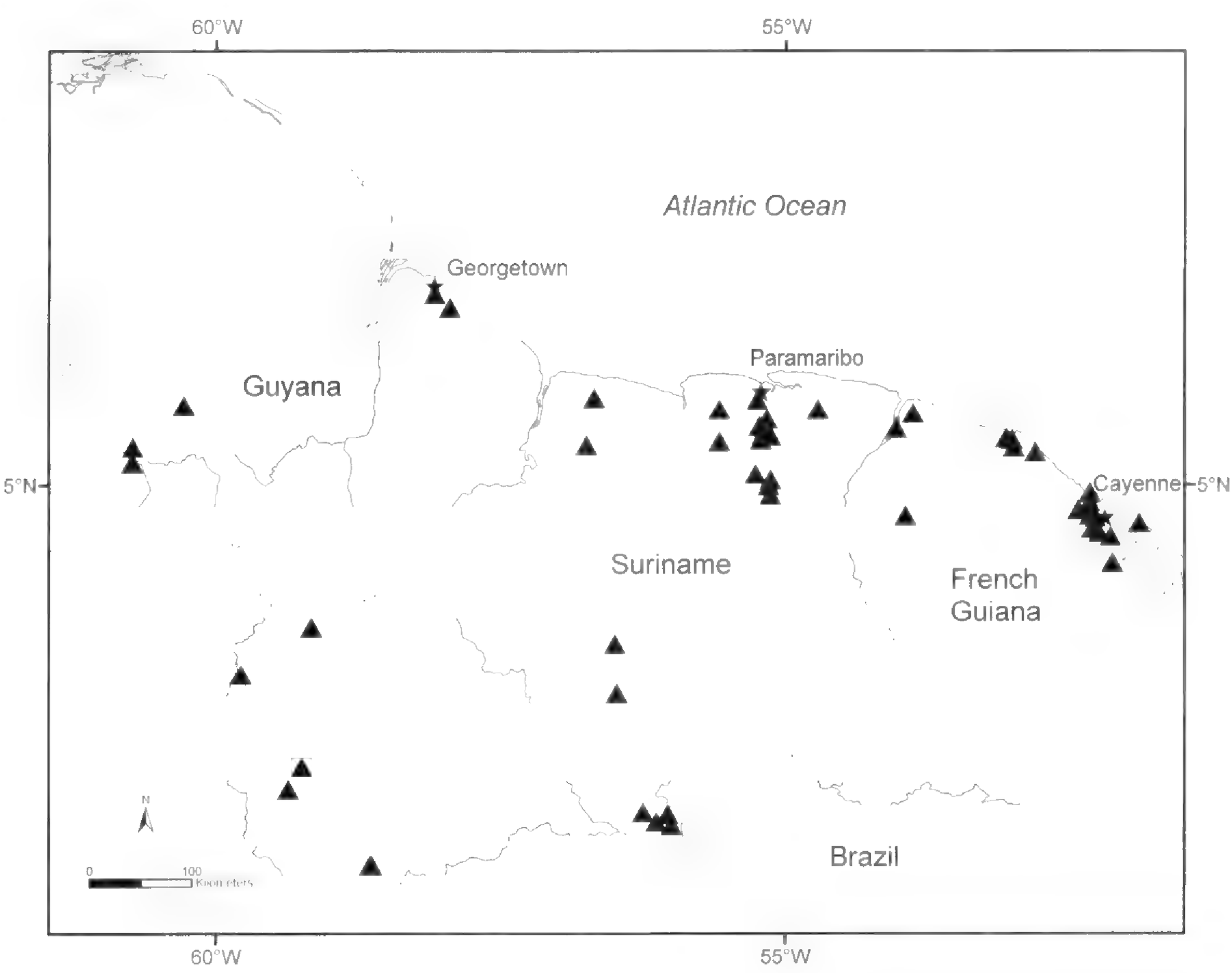

Fig. 38. Distribution of *Rhynchospora rugosa* in the Guianas.

for the hirsute apex just below the inflorescence. Leaves ascending, primarily basal, 6-8, elongate, surpassing the inflorescence, to 8 dm long; sheaths finely veined, hirsute to glabrescent, greenish to pale brown, the inner band herbaceous, closed at summit with a membranous U-shaped to truncate orfice, splitting with age; ligule an obscure to very short membranous band at adaxial base of blade (on some blades); blades 2-4 mm wide, flattened to subfolded, narrowly linear, ascending to flaccid, long-acuminate to apex, finely veined, smooth, green to pale brown, the margins and abaxial midcosta remotely scabrous and beset with elongate, ascending trichomes. Inflorescence 1 or 2 approximate to subremote, compact, corymbose or pyramidal panicles from the upper leaf-like bracts, the panicles (1.5-) 2-4 cm in diam; bracts 2 or 3, the lowermost elongate, 2-3 mm wide, to 7 dm long, greatly overtopping the inflorescence; panicle branches short, trigonous to subcompressed, hirsute particularly on margins, the branches and spikelet pedicels each subtended by a tubular prophyll and linear bract at base, the lower bract ovate-acuminate and long-awned, the upper prophyll smaller, ovate, with a notched apex, the spikelets short-pedicellate, appearing sessile, borne singly or in fasicles of 2 or 3 at branch tips. Spikelets ovoid-ellipsoid, whitish to stramineous or light brown, 50-150 per panicle, 4-5 × 1.3-1.8 mm; scales 8-10 per spikelet, thin, thinly herbaceous to submembranous marginally, whitish to stramineous with a distinct narrow, green, midcosta, prolonged as an antrorsely scabrous awn below the acute to acuminate, emarginate apex, the sides indistinctly veined; fertile scales 6 or 7, subtending 1-2 (-3) bisexual flowers, the distal flowers of a spikelet staminate with abortive pistil, ovate to ovate-elliptic or ovate-lanceolate (distal scales), 3-4 × 1.6-2 mm; sterile scales 2 or 3 at base, ovate, smaller than the fertile, 2-2.5 × 1.2-1.4 mm. Stamens 3, the anthers linear, 1.5-2 mm long, apiculate at apex; styles 2-branched, glabrous, the stigmas ½ to nearly equaling the length of the unbranched portion, minutely scaly. Achene biconvex, obovate, 1.9-2 mm long (excluding style base), 1.1-1.2 mm wide, transversely rugulose with a short-stipitate, cellular-reticulate base, stramineous to light brown, shiny; epidermal cells rectangular, vertically oriented; style base triangular, 0.7-1 mm long, as wide to slightly narrower than the achene body at its base, truncate to rounded or slightly emarginate at apex, lunate to somewhat shallowly lobed at junction with achene apex, whitish, spongy, with a granular or obscurely cellular-reticulate surface; bristles absent.

Distribution: Endemic to the Guianas (Guyana and Suriname).

Habitat in the Guianas: Occurs on granitic outcrops, balds, and rocky savannas or scrub on mountain summits in the Kanuku and Kamoa mountain ranges of Guyana and in the Emma Keten and Bakhuis mountain ranges of Suriname.

Specimens examined: GUYANA: NW Kanuku Mountains, top of Nappi Mountain, 12 km S Nappi village, 03°18'N, 59°33'W, 750-950 m, 8 Feb 1993, *B. Hoffman & R. Foster 3572* (BRG, K, MO, NY, US); Kamoa Mountains, 2 km N of camp on Kamoa River, 01°32'50"N, 58°50'04"W, 520 m, 9 Nov 1996, *H.D. Clarke 2993* (BRG, MO, NY, US); Rewa River; summit of unnamed peak, 5.6 km W of camp, 02°58'49"N, 58°38'27"W, 400 m, 19 Feb 1997, *H.D. Clarke 3676* (BRG, K, MO, NY, US). SURINAME:: In montibus, qui dicuntur Emmaketen, rocksavanna on S side of top SW of Grote Hendriktop, ca. 935 m, 20 Aug 1959, *A.G.H. Daniëls & F.P. Jonker 998* (U); Blanche Marie Vallen, Nickerie Rivier, Lands Bosbeheer, 20 Jun 1965, *P.J.M. Maas & J.A. Tawjoeran 10930* (U).

61. Rhynchospora sanariapensis Steyerm., Fieldiana, Bot. 28: 46. 1951. TYPE: Venezuela; Amazonas, vicinity of Sanariapo, *Steyermark 58469* (holotype: F). Figs. 40, 88A-B.

Caespitose annual or delicate perennial, 5-17 cm tall, in tenuous clumps; rhizome (when present) short, vertical; roots fine. Culms erect to ascending, 0.2-0.7 mm wide, compressed-trigonous to trigonous distally, often with very narrow wing-angles, delicate, soft and flexuous, very finely ribbed, channeled along one side, green with the channel and the larger ribs often pale green, glabrous. Leaves ascending, 2-7 per culm, primarily basal and lower cauline, 3-11 cm long; sheaths short, eligulate, loose, soft, thinly herbaceous, finely veined, green to pale green, glabrous, the inner band whitish herbaceous, truncate to concave at orifice; blades narrowly linear, subinvolute to folded proximally, flattened medially, 0.4-1.2 mm wide (flattened), herbaceous, coarsely veined, smooth abaxially, semi-glossy and cellular-reticulate adaxially, green to pale green, glabrous, margins smooth proximally, remotely

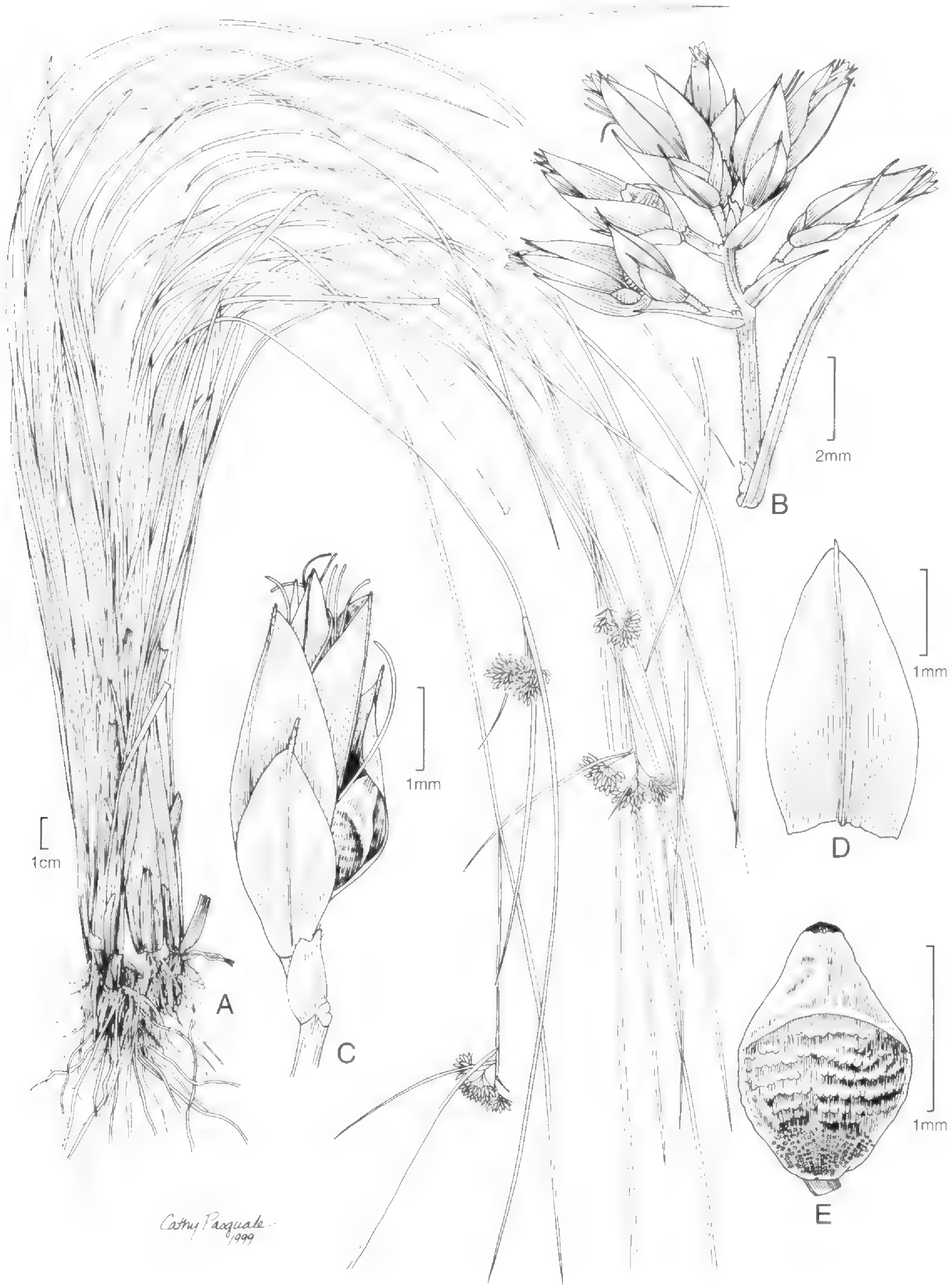

Fig. 39. *Rhynchospora rupicola*. A. Habit. B. Detail of inflorescence panicle branch with spikelets. C. Spikelet. D. Fertile spikelet scale. E. Achene. (A-E, from the holotype, *Daniëls & Jonker*, U).

antrorsely scabrous distally, attenuate to apex. Inflorescence a series of 2 or 3, small, corymbose-fasciculate partial panicles from the upper leaf-like bracts, 5-17 × 7-20 mm, with 3-36 (-50) spikelets per partial panicle, the lowermost one remote from the upper subcontiguous ones, often with few to several spikelets; bracts reduced upwards, the terminal one equaling to 2 or 3 times longer than subtending panicle, that of the lowermost greatly exceeding its subtending partial panicle; peduncles short, that of the lowermost partial panicle to 2 cm long; panicle branches short, ascending, trigonous to flattened-trigonous; spikelets ovoid-lanceoloid, slightly falcate, 2.8-4.3 × 0.6-0.9 mm, acute at base, short-acuminate at apex; scales 6 per spikelet, dorsally obtuse to subrounded, proximal ones of spikelet thinly coriaceous, smooth and semi-glossy, yellowish brown, glabrous, distal ones herbaceous to submembranous, margins scarious, midcosta fine, inconspicuous, extended beyond the acute to obtuse apex as a short mucro; fertile scales 4, ovate-elliptic to ovate-lanceolate, 1.8-3 × 1-1.6 mm; sterile scales 2, ovate, 1-1.4 × 0.7-1 mm. Stamens 2, the anthers 0.6-0.8 mm long, minutely lobed at base, apiculate at apex; style 2-branched, the branches as long as the unbranched portion, exserted beyond apex of subtending scale. Achene biconvex, oblong-obovate, 0.8-1.1 × 0.5-0.7 mm, truncate at apex, cuneate at base, coarsely and deeply rugose with 5 or 6 rugae per face, stramineous to brown, the margins narrowly costate; epidermal cells linear, vertically oriented; style base compressed-triangular, 0.1-0.3 × 0.3-0.5 mm, shallowly lobed at base, the lobes often slightly upturned at tips, crustose, light brown to dark brown; bristles absent.

Distribution: South America (Colombia, Venezuela, and Guyana).

Habitat in the Guianas: Moist soils in savannas and granitic outcrops.

Specimens examined: GUYANA: Bat Mountain, 02°10'41"N, 59°10'30"W, 450 m, 25 Jul 1996, *H.D. Clarke et al. 2438* (US).

62. Rhynchospora saxisavannicola M. T. Strong, Novon 15: 482. 2005. TYPE: French Guiana; Mont Saint-Marcel, zone sud-est du massif, mares gravillonnaires de savane-roche, 300 m, 02°23'00"N, 53°00'20"W, 18 Jul 2002, *J.J. DeGranville, L. Aliker, & C. Sarthou 15283* (holotype: US-3451946; isotypes: CAY, NY, P). Figs. 40, 41, 88C-D.

Caespitose perennial, 3-10 cm long; rhizome short; roots fine, light brown. Culms erect, 0.2-0.5 mm wide, filiform, flattened-trigonous or subterete, soft, flexuous, finely ribbed, pale green, glabrous. Leaves 1-3, ascending, primarily basal, 2-5 cm long; sheaths short, closely clasping culm, ligulate with a narrow band of tissue present at adaxial junction of sheath and blade, herbaceous, finely ribbed, pale brown to stramineous proximally, glabrous, the inner band membranous distally on basal sheaths, herbaceous on upper cauline sheaths except for membranous orifice, truncate at apex; blades compressed-filiform, 0.2-0.3 mm wide, herbaceous, finely veined, glabrous, the apex often curving. Inflorescence a series of 1-3 corymbose, lax, partial panicles from the upper leaf-like bracts, the terminal panicle 5-10 × 3-15 mm, with 1-5 spikelets; bracts to 3 cm long; branches very slender and filiform, flattened-trigonous or subterete in cross section; spikelets slenderly ovoid-lanceoloid, 3-4.5 × 0.5-0.9 mm, straight, acuminate to attenuate at apex, cuneate at base; rachilla strongly flexuose at maturity; scales dorsally obtuse to rounded, herbaceous, distal scales of spikelet thinly herbaceous to submembranous, minutely cellular-striate, semi-glossy, reddish brown with slightly darker brown lineations, glabrous, margins narrowly scarious, midcosta very fine, indistinct except at apex, prolonged beyond the narrowly acute to acuminate apex as a short antrorsely scabrous awn which is slightly recurved; fertile scales 3 or 4, ovate-lanceolate to lanceolate, 2-3 × 0.9-1.3 mm; sterile scales 2 or 3 at base of spikelet, ovate-elliptic, 1-2 × 0.3-1.2 mm. Flowers bisexual; stamens 3, the anthers ca. 1 mm long, apiculate at apex; style 2-branched, equaling to $^2/_3$ length of unbranched portion, long-exserted from subtending scale. Achene biconvex, elliptic to broadly so or subrounded, 0.6-0.8 × 0.5-0.7 mm, rounded at apex, obtuse at base, transversely rugulose with 5 or 6 rugae per face, narrowly cellular-reticulate along margins and at base, shining, glossy, stramineous to brown, often with a longitudinal grey stripe medially; epidermal cells linear, vertically oriented; style base shallowly triangular, 0.1 × 0.2-0.3 mm, abruptly short-attenuate at apex, shallowly 2-lobed at base, or indistinctly so, the ends of the lobes often slightly upturned, brown or blackish; bristles absent.

Distribution: Endemic to the Guianas (French

Guiana and Suriname).

Habitat in the Guianas: Seeps and pools in savane-roche (rock savanna) and granitic outcrops, 280-450 m.

Distinguishing features: Among species of *Rhynchospora* section *Tenues*, *R. saxisavannicola* can be distinguished by the combination of a strongly flexuose spikelet rachilla, elliptic to broadly elliptic achene body, and shallowly triangular, abruptly short-attenuate style base.

Specimens examined: FRENCH GUIANA: Mont Saint-Marcel, zone sud-est du massif, mares gravillonnaires de savane-roche, 300 m, 02°23'00"N, 53°00'20"W, *J.J. DeGranville, L. Aliker, & C. Sarthou 15283* (CAY, NY, P, US). SURINAME: Sipaliwini Savanne area (Brazilian frontier), E Sipaliwini Savanne in saddle between two"4-Gebroeders" mountain tops, 450 m, 1968-1969, *F.H.F. Oldenburger et al. 254* (U); Sipaliwini Savanne area (Brazilian frontier), East Sipaliwini Savanne, at N foot of "4-Gebroeders" mountain, 280 m, 1968-1969, *F.H.F. Oldenburger et al. 986* (U).

63. Rhynchospora schomburgkiana (Boeck.) T. Koyama, Mem. New York Bot. Gard. 23: 67. 1972. *Scirpus schomburgkianus* Boeck., Linnaea 36: 757. 1870, *nom nov.* for *Leptoschoenus prolifer* Nees, J. Bot. (Hooker) 2: 393. 1840, non *Rhynchospora prolifera* Small, 1904. TYPE: Brazil; Islands in the Rio Negro, *Schomburgk 971* (holotype: K!; isotype: BM!, P). Figs. 40, 70C-D.

Micropapyrus viviparoides Suess., Bot. Jahrb. Syst. 73 (Heft. 2): 116, t. 9, f. 3 & 4, t. 10, f. 5. 1941. TYPE: Brazil; Alto Amazonas, Civitas, Rio Negro, San Felippe, sandiges Ufer in Urwald, *Luetzelburg 22381* (holotype: M).

Caespitose perennial, 3-17 cm long; rhizome short, ascending; roots fine. Culms ascending, 0.3-0.6 mm wide, compressed, somewhat 2-sided

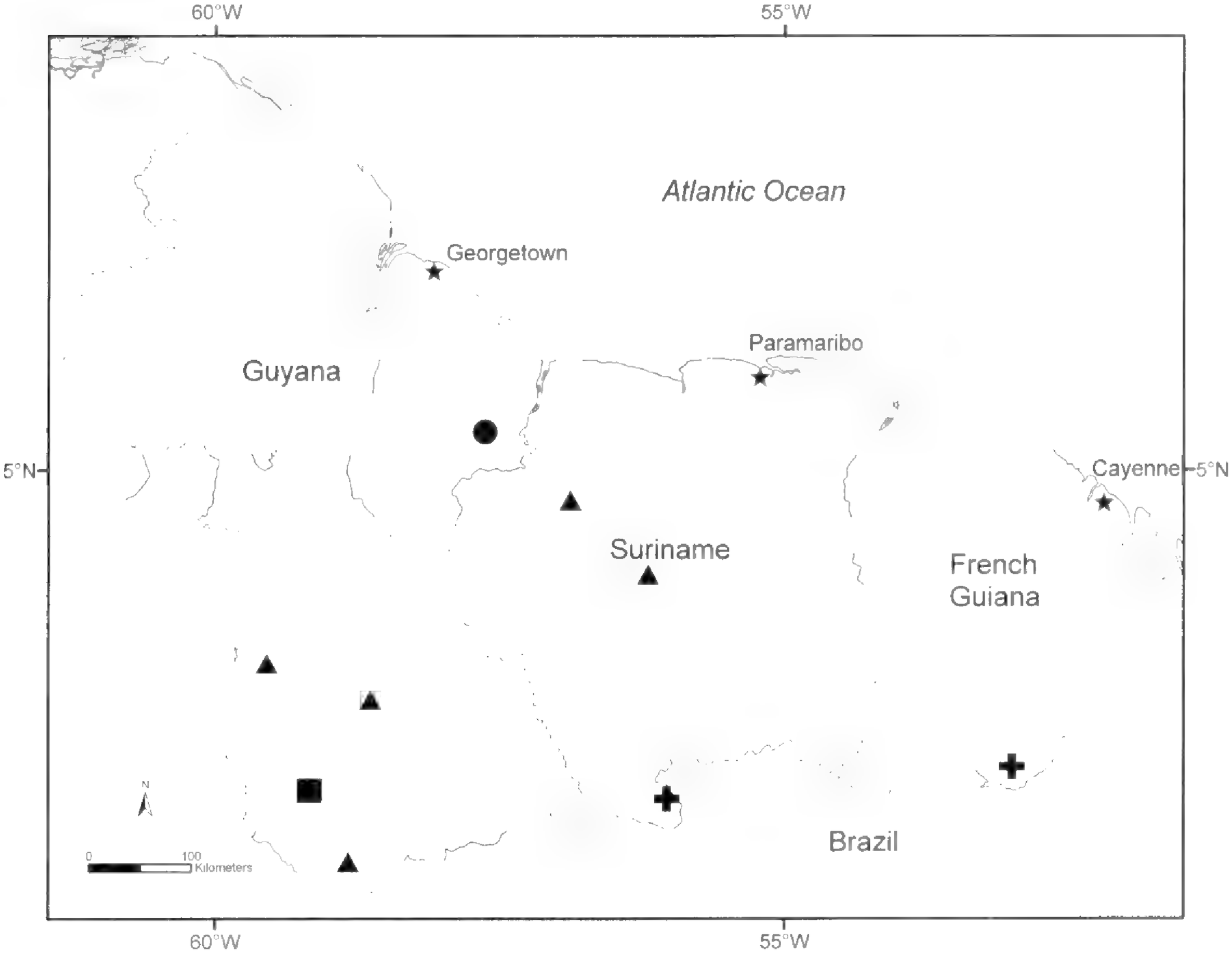

Fig. 40. Distribution of ▲*Rhynchospora rupicola*, ■*R. sanariapensis*, ✚*R. saxisavannicola*, and ●*R. schomburgkiana* in the Guianas.

proximally, compressed-trigonous distally, soft, coarsely ribbed, green, glabrescent to antrorsely hirsutulous. Leaves many, ascending, primarily basal, 1 or 2 lower cauline, 2.5-12 cm long; sheaths short, eligulate, soft, finely veined, pale brown to tinged with dark brown, glabrous to antrorsely hirsutulous, subglossy proximally, inner band membranous, reddish brown, the orifice glabrous, truncate to concave on basal sheaths, deeply U-shaped on cauline sheaths; blades linear-lanceolate, 0.4-1.4 mm wide, subflattened proximally, subinvolute to folded distally, soft, grayish green, glabrous to antrorsely hirsutulous, finely veined abaxially, 2-veined adaxially, each vein running close and paralleling either margin, medial surface between these finely cellular-reticulate, margins smooth proximally to antrorsely scabrous distally, the apex acuminate to an acute tip. Inflorescence a terminal compound cymose panicle, 2.5-9 × 2-7.5 cm; involucral bracts linear-setaceous, antrorsely scabrous along margins, shorter than inflorescence; branches compressed-trigonous to subterete, smooth to antrorsely scabrous-hirsutulous; spikelets 15-60, often proliferating (forming bulbets), narrowly elliptic-lanceolate, acuminate at apex, cuneate at base, 3-4.2 × 0.6-1.1 mm, the scales spreading with maturing achenes; scales 4-10 per spikelet, submembranous, subtranslucent, somewhat laterally compressed and dorsally acute at anthesis, becoming dorsally compressed and dorsally obtuse to subflattened with maturing achenes, brown, often with dark brown lineations, glabrous, margins scarious, the midcosta fine, pale brown, extending beyond the acute to acuminate apex as a short murco on distal scales, often a short awn on proximal scales; fertile scales 3-8, ovate-lanceolate, 2-3.5 × 1-1.2 mm; sterile scales 1 or 2, ovate to ovate-lanceolate, 1.2-2.3 × 0.4-1 mm. Stamens 2, the anthers 1-1.6 mm long, apiculate at apex, with crystalline papillae at base; style 2-branched, the branches ½ - ⅔ length of style, long-exserted beyond apex of scale. Achene biconvex with unequal sides, appearing somewhat plano-convex, narrowly elliptic-obovate, 1.4-2 × 0.5-0.8 mm, indistinctly longitudinally wrinkled and faintly transversely rugulose (seen only when exocarp of mature achenes is separating from epicarp), brown to reddish brown, sometimes with a red spot medially on adaxial side, gradually narrowed to a cellular-thickened and often lobed pale brown base, truncate to subrounded at apex with a cellular thickened rim; epidermal cells isodiametric with low, rounded central nodules; style base short-conic, 0.3-0.5 mm long, 0.2-0.3 mm wide at base, spongy-thickened, brown to reddish brown or blackish, subconfluent with achene body but surrounded at base by the cellular-thickened rim of achene apex; bristles 3 (-6), flattened-subulate, usually shorter than achene body, ⅓ to ⅔ length of achene body but sometimes one as long as achene body, longer bristles often curling, antrorsely barbed, reddish.

Distribution: Northern South America (Colombia, Venezuela, Guyana, and Brazil).

Habitat in the Guianas: Periodically flooded sand savanna and sandy shores of rivers and streams, 0-25 m.

Distinguishing features: The habit of this plant is unique among *Rhynchospora*. Its cymose inflorescence is much like a *Bulbostylis* or *Fimbristylis* and it spikelets are often proliferous. The narrowly ellipsoid achene with its thickened apex and short-conic style base which is subconfluent with the achene apex, is not characteristic of any other American species of *Rhynchospora*.

Specimens examined: GUYANA: Canje River, ± 0.75 km N of Ekwarun River, 05°20'N, 57°38'W, 0-25 m, 10 Apr 1987, *J.J. Pipoly et al. 11388, 11392* (B, NY, U, US). GUYANA or BRAZIL: Islands in the Rio Negro, 1840, *R. Schomburgk 971* (BM, K, US).

64. Rhynchospora splendens Lindm., Kongl. Svenska Vetensk. Acad. Handl. ser. 3, 26(9): 26. 1900. TYPE: Southeastern Brazil; Rio de Janeiro, *Glaziou 11650* (holotype: S). Figs. 43, 69C-D.

Coarse, rhizomatous perennial, 100-225 cm tall; rhizome short, nodose, horizontal; roots coarse; sheathing base of culm 6-10 mm wide. Culms erect, 3.5-7 mm wide, trigonous to obtusely so, often channeled medially, stiff and hardened, finely ribbed, many-noded, internodal regions finely antrorsely scabrous to smooth on ribs, otherwise smooth, green, glabrous. Leaves numerous, primarily cauline, 50-102 cm long; sheaths relatively short, somewhat loose and inflated, eligulate, finely veined, the veins often finely antrorsely scabrous distally, pale green proximally, green distally, glabrous, inner band herbaceous, the orifice U-shaped to deeply so; blades linear, plicate to subflattened, 7-14 mm wide, herbaceous, smooth, green both sides,

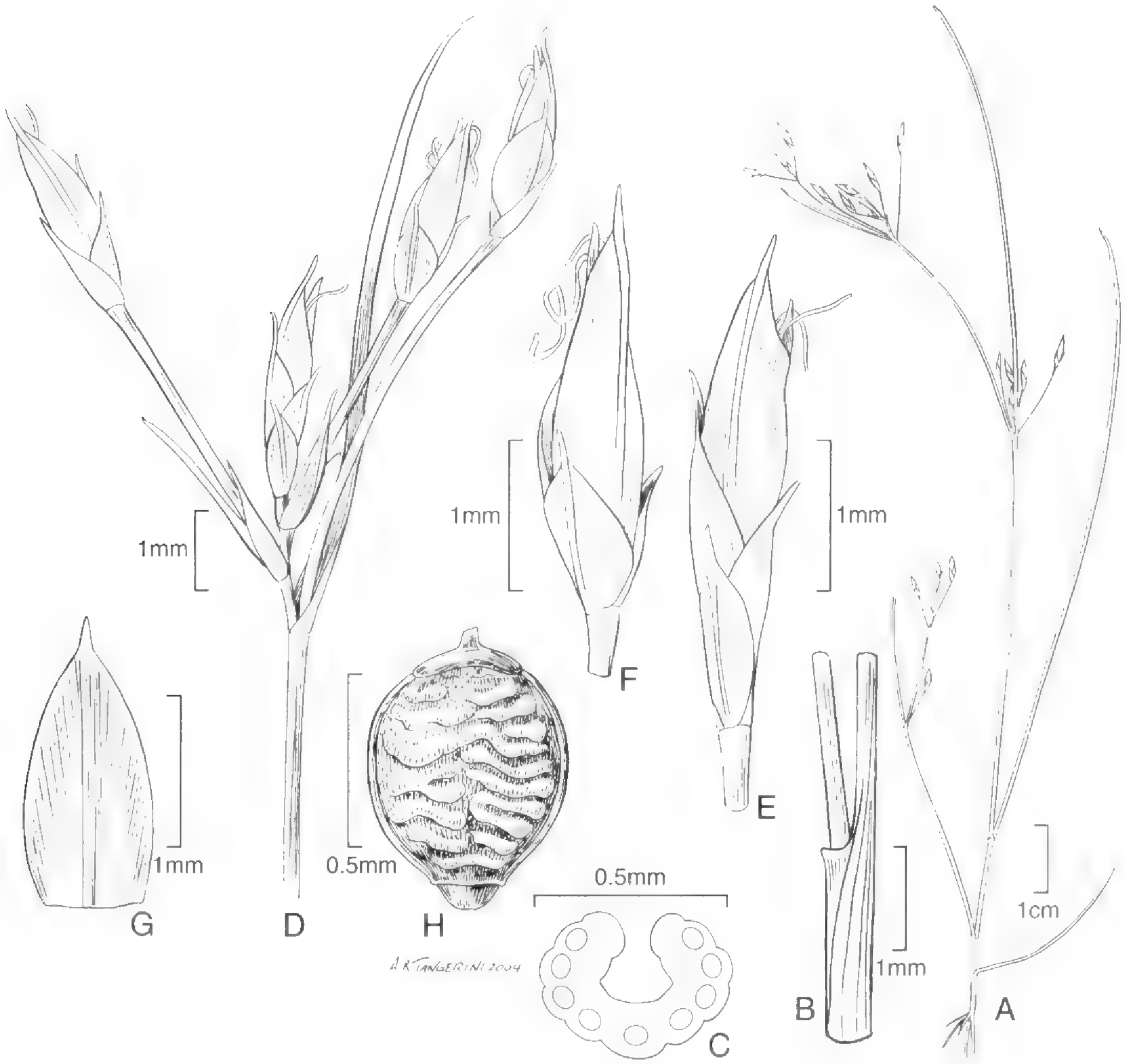

Fig. 41. *Rhynchospora saxisavannicola*. A. Habit. B. Section of culm showing junction of leaf sheath and blade. C. Cross section of leaf blade. D. Terminal inflorescence corymb. E, F. Spikelets. G. Fertile spikelet scale. H. Achene. (A-H, from *DeGranville 15283*, US).

antrorsely scabrous on margins and abaxial midvein, long-acuminate or attenuate to triquetrous tip. Inflorescence a series of 6-9, lateral, congested to somewhat open, corymbose partial panicles from the upper leaf-like bracts; partial panicles 1.5-5 × 2-6.5 cm; bracts well-developed, elongate, but reduced distally, exceeding partial panicles; inflorescence branches compressed-trigonous, finely ribbed, the ribs closely and finely antrorsely scabrous, the spikelets congested at branch tips in hemispherical or subglobose clusters, with 40-170 per partial panicle; spikelets linear-lanceoloid, spine-like when immature, 9-12 × 1-1.4 mm, attenuate to apex, obtuse at base; scales dorsally obtuse to rounded, herbaceous to thinly so, the terminal ones submembranous, smooth, semi-glossy, pale brown, brown lineolate (at least distally), glabrous, margins entire, ciliolate (at least distally), midcosta indistinct or evident only towards apex, pale, wire-like, prolonged beyond the obtuse to subrounded (proximal scales) or acute to short-acuminate (distal scales) as a short awn; fertile scales 3, ovate-lanceolate to linear-lanceolate, 5-9 × 1.7-3.3 mm; sterile scales 4 or 5, ovate to ovate-lanceolate, 1.5-5.7 × 1.5-2.3 mm. Stamens 3, the anthers 3.5-6 mm long, apiculate at apex, truncate at base; style 2-branched, the branches short, ¼ length of unbranched portion.

Achene biconvex, elliptic-oblate, widely elliptic, or subrounded, 2.5-3.1 × 1.8-2.7 mm, obtuse at both base and apex, finely transversely rugulose to nearly smooth at maturity, often with some longitudinal wrinkles, semi-glossy, brown; epidermal cells rectangular, vertically oriented; style base linear-lanceolate, 3.5-4.5 mm long, 1-1.4 mm wide at base, thickened and subspongy, pale brown to brown; bristles absent.

Distribution: South America (Venezuela, Guyana, Brazil, and Bolivia).

Habitat in the Guianas: Known only from Mt. Roraima, Guyana by a single collection.

Specimens examined: GUYANA: Roraima, 1863-1864, *C.F. Appun 1385* (K).

65. Rhynchospora spruceana C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 40. 1908. LECTOTYPE: Brazil; Santarem, *Spruce 627* (K!; isolectotype: NY), designated by T. Koyama, Mem. New York Bot. Gard. 23: 77. 1972. Figs. 42, 43, 86A-B.

Rhynchospora filiformis var. *latifolia* Uittien, Recueil Trav. Bot. Néerl. 22: 336. 1925. LECTOTYPE: Suriname, APara-Gebiet, Zanderij I, in der Savanne, *Essed 94* (U!), here designated.

Rhynchospora graminea Uittien, Recueil Trav. Bot. Néerl. 32: 229. 1935. LECTOTYPE: Suriname; Zanderij I, savannah, *Lanjouw 339* (U!; isolectotypes: NY!, US!), here designated.

Caespitose perennial, 15-35 cm tall; rhizome short, inconspicuous; roots medium to coarse, 0.8-1.2 mm thick; sheathing base of culm 2-5 mm wide. Culm erect to ascending, trigonous, firm, coarsely ribbed proximally, finely ribbed distally, green, glabrous, bluntly antrorsely scabrous on angles distally. Leaves 7-17 (per culm), stiffly ascending, primarily basal, 1-3 cauline, 3.5-20 (-22) cm long; sheaths eligulate, herbaceous, finely veined, green, glabrous, inner band membranous, the orifice obtuse, often purple-dotted; blades linear, 1.2-2.7 (-3) mm wide, V-shaped to subflattened, firm, substiffened, distinctly finely veined abaxially, smooth and indistinctly veined adaxially, green, glabrous, margins often subrevolute, margins and abaxial midvein antrorsely scabrous, the apex acuminate, triquetrous. Inflorescence a terminal and 1 or 2 lateral corymbose partial panicles from the upper leaf-like bracts; bracts typically shorter and narrower than blades; partial panicles 2.7-9.5 × 0.7-5 (-6) cm, with 6-35 spikelets, the peduncles of the lateral ones trigonous, 2-7 cm × 0.2-0.4 mm; branches compressed-trigonous, crescentiform or subflattened, antrorsely scabrous on margins; spikelets narrowly ellipsoid-lanceoloid, 6-8.5 × 1.1-1.4 mm, acuminate at apex, narrowly cuneate at base; scales 8-12 per spikelet, dorsally broadly obtuse to subrounded, lower fertile and sterile scales subcoriaceous, smooth, semi-glossy to glossy, faintly cellular-striate, upper fertile scales herbaceous to submembranous, ochre (orangish brown), glabrous, margins broadly scarious, minutely lineolate, midcosta indistinct proximally, distinct distally, slender, pale brown, extending beyond acute to narrowly acute apex as a 0.5-1 mm long antrorsely scabrous awn; fertile scales 5-8, those subtending the terminal flowers of spikelet often staminate only; ovate-elliptic to ovate-lanceolate, (3.5-) 4-7 × (1.1-) 1.5-2.7 mm; sterile scales 3 or 4, 1.6-3.8 × 0.9-2 mm. Stamens 3, sometimes 1 or 2 maturing only in staminate flowers, the anthers, 1.8-2.2 (-2.5) mm long, apiculate at apex, truncate with minute crystalline papillae at base; style distinctly 2-branched, 1 to 1.5 times length of unbranched portion. Achene asymmetrically biconvex, thicker near apex, obovate to narrowly obovate, 1-1.3 × 0.8-1 mm, truncate at apex, subcuneate at base, transversely rugulose, shiny, light brown, often grayish medially; epidermal cells rectangular to linear, vertically oriented; style base depressed-triangular, shallowly 2-lobed, 0.1-0.2 mm long, 0.6-0.9 mm wide at base, brown; bristles absent.

Distribution: Northern South America (Venezuela, Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: Seepages, wet depressions, and pond margins in sand savanna, 110-580 m.

Nomenclature: Koyama (1972) based his lectotypification of *R. spruceana* C. B. Clarke on *Spruce 627* at K which is conspecific with the later described *R. graminea* Uittien.

Specimens examined: FRENCH GUIANA: Savane do Corossony, Piste St. Elie, 20 Feb 1986, *C. Feuillet & B. Barthés 2997* (CAY, US). GUYANA: Kaietuk, Kaieteur savanna, 1100 ft, 31 Aug 1933, Cambridge University Expedition 1933, *T.G. Tutin 689* (BM, K, U, US); Kaieteur Plateau, Potaro River, 8 May 1944, *B. Maguire & D.B. Fanshawe*

23308 (F, K, MO, NY, U, US); Rupununi savanna, near Kanuku Mountains, 14 Feb 1959, *J. Lanjouw et al. 746b* (U); Kurikabaru, 10 Jan 1960, *S.A. Harris K68* (K); St. Cuthbert's trail, 4.5 mi. from highway, 5 Jan 1969, *U.G. Bio. 106 25* (BRG, K); St. Cuthbert, St. Francis trail, Demerara, Jun 1970, *D.H. Davis 2000* (BRG, K); Imbaimadai, Upper Mazaruni River, Aug 1967, *D.H. Davis 338* (BRG, K); Warenama (Berbice), Oct 1973, *A. Cooper 90* (BRG, U); Pakaraima Mountains, N of Imbaimadai, 05°43'N, 60°18'W, 518 m, 20 Jun 1986, *J.J. Pipoly & K. Alfred 7877* (U, US); Kaieteur Falls, vicinity of Kaieteur airstrip, 05°11'N, 59°29'W, 450 m, 8 Oct 1987, *L.P. Kvist et al. 83* (CAY, F, MO, NY, US); 3-4 km SW of Imbaimadai, between Partang and Karowrieng Rivers, 05°41'N, 60°16'W, 570-580 m, 20 Dec 1989, *L.J. Gillespie & D.R. Smart 2800* (CAY, MO, US); Pakaraima Mountains, 50 m E of Imbaimadai airstrip, 05°42'N, 60°17'W, 525 m, 31 May 1992, *B. Hoffman 2000* (CAY, U, US); Gunn's Strip savanna, 1 km W of village, 01°40'N, 58°38'W, 250 m, 18 Feb 1994, *T.W. Henkel et al. 4551* (US); Kaieteur National Park, along airstrip, 05°10'N, 59°29'37"W, 300-350 m, 10 Mar 1995, *C.L. Kelloff 1194* (US); Rupununi Southern Savnna, ponds up to several km N of Dadanawa & E of Rupununi River, 02°50'N, 59°25'W, 110-120 m, 19 Aug 1995, *C.N. Horn et al. 10095* (US); Kaieteur National Park, near airstrip, 05°11'41"N, 59°28'53"W, 400-450 m, 15 Jun 1998, *C.L. Kelloff & R. Williams 1381* (US). SURINAME: Zanderij I, Aug 1914, *Essed 94* (P, U); Zanderij I, 27 Jul 1920, *Pulle 26* (U); Zanderij I, 28 Jul 1920, *A.A. Pulle 47* (U); Zanderij I, 28 Jul 1920, *H. Uittien 47* (K); Zanderij I, 30 Jul 1933, *H. Uittien 339* (US); Zanderij I, 30 Jul 1933, *J. Lanjouw 339* (K, U); Zanderij II, 3 Jun 1944, *B. Maguire & G. Stahel 23675* (U); Zanderij I, 9 Sep 1948, *J. Lanjouw & J.C. Lindeman 228* (K, U); Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp, savanna near km 10.9, 8 Oct 1948, *J. Lanjouw & J.C. Lindeman 716* (U); Zanderij I, 19 Mar 1951, D.G. Geyskes 83 (U); Matta Savanne, 28 Jul 1952, *Ir J.G.P. Dirven LP258* (U); Matta Savanne, 28 Jul 1952, *Ir J.G.P. Dirven LP260* (U); Kasiwinika (Cassewinica) Kreek, near Kopie, 16 Jul 1953, *J.C. Lindeman 4369* (U); Ope savanne bij Zanderij, 14 Mar 1956, *Ir J.G.P. Dirven LP597* (U); Boven Coesewijne, 16 May 1956, *P.C. Heyligers 7* (U); Prope Jodensavanne (fluv. Suriname), tr.23, p.6, 5 May 1957, *P.C. Heyligers 794* (U); Prope Jodensavanne (fluv. Suriname), 22 Jun 1957, *P.C. Heyligers 803* (U); Prope Jodensavanne (fluv. Suriname), 22 Jun 1957, *P.C. Heyligers 804* (U); Prope Jodensavanne (fluv. Suriname), 21 Jun 1957, *P.C. Heyligers 841* (U); Lobin-savanna, inter Prope Jodensavanne (fluv. Suriname), 20 Jun 1957, *P.C. Heyligers 832* (U); Prope Jodensavanne (fluv. Suriname), tr. 32, p. 228, 20 Jun 1957, *P.C. Heyligers 837* (C, U); Prope Jodensavanne (fluv. Suriname), 22 Jun 1957, P.C. Heyligers 806 (U); Jodensavanne, fluv. Suriname, 24 Jun 1957, *P.C. Heyligers 839* (NY, U); Zanderij I and Hannover, 8 Aug 1958, *J. van Donselaar & W.A.E. van Donselaar 402* (U); Gros Savanne (prope km 103), 3 Apr 1959, *J. van Donselaar 674* (U); Zanderij I, 18 May 1959, *W.A.E van Donselaar DC10* (U); Kappel Savanne, prope pedem australem montis Tafelberg (Saramacca District), 300 m, 15 Feb 1961, *K.U. Kramer & W.H.A. Hekking 2906* (U); Kappel Savanne, prope pedem austalem montis Tafelberg, ca. 300 m, 16 Feb 1961, *K.U. Kramer 3277* (U); Zuid Rivier, vicinity of Kayser Airstrip, 45 km above confluence with Lucie Rivier, Wilhelmina Gebergte, 270 m, 1 Jul 1963, *B. Maguire et al. 53961* (US); Sipaliwini Savanne, 24 Aug 1966, *J. van Donselaar 3547* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 2 Sep 1967, *J.T. Wildschut & P.A. Teunissen 11599* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 12 Jan 1968, *J.T. Wildschut & P.A. Teunissen 11405* (U, US); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 12 Jan 1968, *P.A. Teunissen & J.T. Wildschut 11405* (F, US); Natuurreservaat Brinkheuvel, (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 15 Jan 1968, *J.T. Wildschut & P.A. Teunissen 11439* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 12 Jan 1968, *J.T. Wildschut & P.A. Teunissen 11408* (U); Blakawatra, on Cordonpad, Aug 1978, *J. Procter 4739* (U); Sipaliwini Savanne area on Brazilian frontier, W Sipaliwini Savanne, 30 Aug 1968, *F.H.F. Oldenburger et al. ON13* (U); near Matta, 8 Feb 1976, *R. Jansma LBB15900* (U); Zanderij Savanne, Feb 1976, R. Jansma LBB15655 (U).

66. Rhynchospora steyermarkii T. Koyama, Mem. New York Bot. Gard. 23: 70. 1972. TYPE: Venezuela; Bolivar, N of El Palmar, *Steyermark 87853* (holotype: NY!; isotypes:

F!, US!, VEN). Figs. 43, 76E-F.

Stoloniferous perennial, 5-12 cm tall; rhizome short to elongated and bearing fibrous remnants of old leaf bases; stolons slender, leafy, rooting at the nodes; roots fine; sheathing base of culm 3-6 mm wide. Culm ascending to erect, 0.2-0.3 mm wide, trigonous to triquetrous distally, flexuous, soft, delicate, easily compressed, coarsely ribbed, green with whitish ribs, hirsute with broad-based or pustulate-based trichomes. Leaves 12-23, ascending, basal and lower cauline, lower basal ones often reflexed at maturity, 4.5-18 cm long; sheaths eligulate, short, soft, slightly inflated, finely veined, pale green or stramineous, hirsute, inner band membranous, light reddish brown, the orifice truncate to concave; blades narrowly linear, 0.8-3 mm wide, the upper basal ones exceeding the inflorescence, flattened proximally, subplicate distally, soft, finely veined, the veins often whitened or stramineous, dark green adaxially, green abaxially, hirsute abaxially, glabrescent adaxially (except margins and abaxial midvein), margins and abaxial midvein hirsute, the apex long-attenuate to triquetrous, blunt tip. Inflorescence a single congested fascicle of (1-) 2-4 (-5) spikelets at the summit of the culm, 5.5-8 × 4-7 mm; involucral bracts 1 or 2, leaf-like, 2-13 × 0.1-0.3 mm; spikelets (1-) 2-4 (-5), ovate-elliptic, 4-6 × 1-1.7 mm, acute at apex, short-cuneate at base; scales 10-19 per spikelet, laterally compressed and somewhat keeled when immature, becoming dorsally rounded at maturity, soft, relatively smooth, whitish to stramineous, distal scales of spikelet often red-lineolate, glabrous, margins entire, midcosta wire-like, green, whitish medially, prolonged beyond the acute apex as a short mucro; fertile scales 7-15, ovate-elliptic to ovate-lanceolate, 3-4 × 1.2-2.4 mm; sterile scales 3 or 4, ovate to ovate-lanceolate, 1.6-2.8 × 0.8-1.8 mm. Stamens 3 or sometimes 2, the anthers 1.7-2.3 mm long, apiculate at apex, bi-lobed at base; style 2-branched, ½ to as long as unbranched portion, well-exserted beyond apex of subtending scale. Achenes biconvex, obovate to broadly obovate, 1-1.1 mm long and as wide, truncate at apex, abruptly narrowed near base, glossy, transversely rugulose, light brown to yellowish brown; epidermal cells rectangular, vertically oriented; style base depressed-triangular, 2-lobed (like a mustache), 0.2-0.3 mm long, 0.8-1 mm wide at base, crustose, light brown to stramineous; bristles absent.

Distribution: Endemic to the Guayana shield (Venezuela and Guyana).

Habitat in the Guianas: Known only from a single collection made on the eastern slope of Malakwalai-Tipu, Pakaraima Mountains, 1100 m.

Specimens examined: GUYANA: Pakaraima Mts; Upper Ireng watershed; E slope of Malakwalai-Tipu, downslope from summit, forest island (25-35 m canopy) on sandstone soils; forming ground thickets, 04°48'N, 60°16'W, 1100 m, 11 Jul 1994, *T.W. Henkel, M. Chin & L. Williams 5550* (US).

67. Rhynchospora subdicephala T. Koyama, Bull. Natl. Sci. Mus., Tokyo, B. 2(4): 173. 1976. TYPE: French Guiana; Tumuc-Humuc, Layon ORSTOM, Koulimapo Pann to Mitakara, *deGranville 1126* (holotype: NY!; isotype CAY!). Figs. 43, 73C-D.

Caespitose perennial, (30-)50-90 cm tall; rhizome short; roots coarse, rigid, brown, 1-2 mm thick. Culms ascending, 1.5-2.5 mm wide proximally, 0.9-1.5 mm wide distally, acutely triquetrous proximally, subflattened-trigonous distally, firm, finely ribbed, green, glabrous, the angles hispid with ca. 1-2 mm long divergent tubercle-based trichomes, glabrate towards base. Leaves numerous, primarily basal, 2 or 3 cauline, (9-) 20-70 cm long; sheaths pale yellowish brown or pale brown, finely veined, hispid to glabrate proximally on angles, glabrous on sides, inner band of basal sheaths membranous, splitting with age, with a deeply U-shaped orifice, inner band of cauline sheaths herbaceous except for the membranous U-shaped orifice, the summit hispid below the orifice; ligule absent; blades linear, plicate, 2-6 mm wide, long-acuminate to apex, abaxial surface glabrous except for the hispid midvein, adaxial surface hispid along primary veins, the margins hispid. Inflorescence a single terminal, or often with 1 or 2 lateral, remote, globose, obloid, or very widely ovoid, heads of many spikelets from the upper leaf-like bracts, the heads 9-16 cm in diam; bracts 2 or 3, much reduced, 0.5-2.5 cm long, ascending to divergent in immature inflorescences, reflexed in mature inflorescences, the lowest exceeding the inflorescence; bracteoles many, lance-linear; spikelets 1- or sometimes 2-flowered, with 4-6 scales, each subtended by an unawned, ovate-lanceolate prophyll, elliptic-lanceolate, narrowly

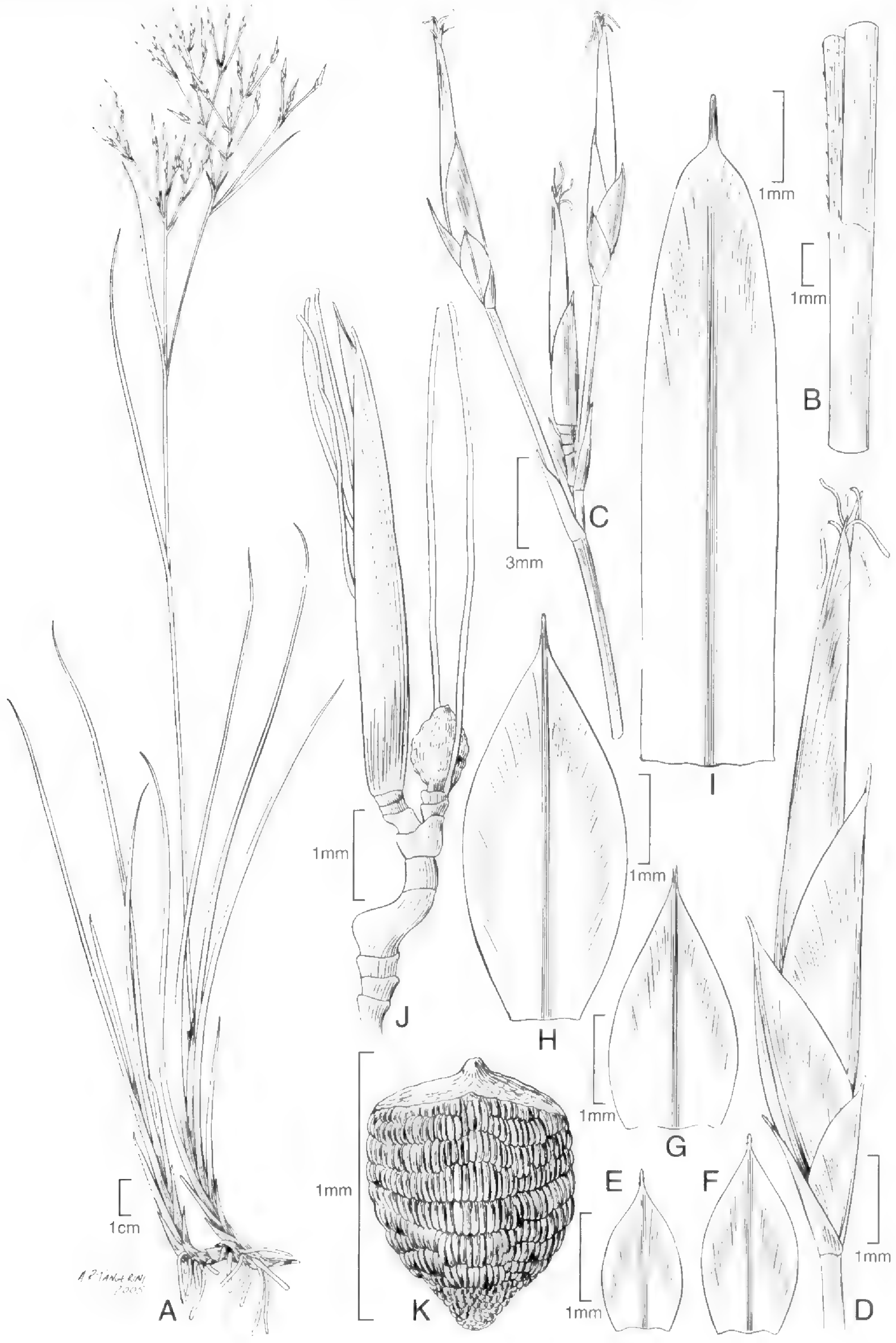

Fig. 42. *Rhynchospora spruceana.* A. Habit. B. Section of culm showing junction of leaf sheath and blade. C. Inflorescence branch showing spikelets. D. Spikelet. E, F, G. Lower sterile spikelet scales. H, I. Fertile spikelet scales. J. Inflorescence branch showing denuded spikelet rachilla, immature achene with filaments, and terminal spikelet scales. K. Achene. (A, from *Black 51-12589*, US and *Maguire & Fanshawe 23308*, US; B-J, from *Horn et al. 10095*, US; K, from *Lanjouw 339*, US).

acute at apex, narrowly cuneate at base, (3.5-) 4-5.7 (-6) mm long (excluding awns), 0.9-1.2 mm wide, laterally compressed, the scales spirally imbricate, spreading at maturity; scales 4-6 per spikelet, ovate-lanceolate to ovate-elliptic, laterally compressed at anthesis, thinly chartaceous or membranous, with entire margins, pale green, brown medially, glabrous, shiny, awned, finely 7- or 8-nerved on each side (excluding 3-nerved midcosta), midcosta with 3 distinct veins, the 2 lateral ones beset with divergent, hispid, tubercle-based trichomes, extending distally along base of the reddish to purplish black awn; fertile scales 1 or 2, dorsally rounded at maturity, 3-4.5 (-5) mm long (excluding awn), 0.9-2.1 mm wide; sterile scales 3 or 4, 2-3.5 mm long (excluding awn), 0.8-1.2 mm wide. Stamens 3, or 2 and 1 abortive, the anthers 1.4-2 (-2.5) mm long with a minute, sharp-pointed, subulate appendage at tip, truncate at base; style unbranched or shallowly bifid at apex, elongate, greatly exceeding scales, blackened, minutely scaly, sparsely pubescent. Achenes obovate to obpyriform, biconvex, (1.5-) 1.7-2.1 × (1.2-) 1.4-1.9 mm, pale brown to brown, transversely rugose, with 4-8 bands of rugae, often smooth medially in a vertical band below middle on each side, smooth at apex; epidermal cells linear, vertically oriented; style base depressed, subdiscoid , 0.3-0.5 mm long, 0.5-0.8 mm wide at base, constricted at its base; bristles absent.

Distribution: Northern South America (Venezuela, French Guiana and Brazil).

Habitat in the Guianas: Granite inselbergs in "savane roche" (rock savanna) communities, 50-411 m.

Specimens examined: FRENCH GUIANA: Oyapock, Roche Mon Père, 7 Mar 1957, *J.J. Hoock s.n.* (K, U, US); Roche mon Père, Oyapock, 14 Dec 1965, *R.A.A. Oldeman 1766* (CAY, P); Haut Oyapock, Mont St. Marcel, Grande, 300-350 m, 30 Jul 1975, *J.J. de Granville 2620* (CAY); Fleuve Approuague, Rivière Arataye, Saut Pararé, 29 Aug 1977, *C. Sastre 5826* (CAY); Fleuve Approuague, Rivière Arataye, Saut Pararé, 350 m, 22 Oct 1978, *C. Sastre 6217* (CAY, P); Massif des Emerillons, centre, 300-350 m, 11 Sep 1980, *G. Cremers 6630* (CAY); Piton Rocheux Remarquable, Région de la Haute, Crique Armontabo, Bas Oyapock, 50-100 m, 24 Feb 1981, *G. Cremers 7113* (CAY, U); Montagne des Nouragues, Bassin de l'Arataye, sommet, 411 m, 04°03'N, 52°42'W, 27 Apr 1988, *C. Sarthou 283* (CAY, NY); Savane Roche de Virginie, Bassin de l'Approuague, 50 m, 04°11'N, 52°09'W, 11 Feb 1991, *G. Cremers & P. Petronelli 11849* (CAY, NY, P); Savane Roche du Quatorze Juillet, bassin du Bas-Oyapock, 60 m, 16 Apr 1991, *G. Cremers & S. Gautier 12159* (B, CAY, NY, P, U); Pic du Grand Croissant, Bassin de l'Armontabo, 03°31'N, 52°22'W, 150 m, 14 Apr 1993, *J.J. de Granville 11747* (CAY, GENT,NY, P, U, US); Roche Touatou, Bassin de l'Oyapock, versant sud du Mont Touatou,130 m, 18 May 1995, *G. Cremers & J.J. de Granville 13983* (CAY, NY, P, U, US); Roche Touatou, Bassin de L'Oyapock, 130 m, 02°57'N, 52°32'W, 18 May 1995, *G. Cremers & J.J. de Granville 13981* (CAY, NY, P, U, US); Savane Roche Anabelle, Bassin de l'Approuague, 120 m, 10 May 1997, *G. Cremers & J.J. de Granville 15253* (CAY, NY, P, US); Montagnes de la Trinité, bassin de la Mana, 04°37'N, 53°22'W, 300 m, 17 Mar 1997, *J.J. de Granville 13415* (CAY, NY, P, US); Mont Saint-Marcel, zone sud-est du massif, 300 m, 02°23'00"N, 53°00'20"W, 18 Jul 2002, *J.J. de Granville et al. 15286* (CAY, GENT, K, NY, P, U, US).

68. Rhynchospora sublanata Lindeman & Donsel., Acta Bot. Néerl. 20: 444. 1971. TYPE: Suriname; Savanna 2 km SW of airstrip "Sipaliwini", *Oldenburger & Norde 952* (holotype: U!; isotypes: BBS, NY!). Figs. 44, 78C-D.

Rhizomatous perennial, 45-75 cm tall, culms few together; rhizome short; roots 0.5-1.2 mm thick, brown. Culms ascending, 0.7-1.4 mm wide, obtusely triquetrous to obtusely trigonous proximally, trigonous to compressed trigonous distally, firm, coarsely ribbed, green, sparsely pilose proximally, glabrous distally. Leaves 8-30, primarily basal, 3 or 4 cauline leaves below inflorescence, 9-30 (-34) cm long; sheaths brown to dark brown, finely veined, pilose to glabrescent distally, glabrate proximally, inner band membranous, splitting with age, pilose distally, the orifice truncate to concave; ligule absent; blades linear, stiffly ascending, V-shaped to folded in cross section proximally, often plicate distally, (1.2-) 1.6-3 (-5) mm wide, finely veined, green, pilose abaxially, often subglabrous to glabrous adaxially, at least towards base, long-acuminate to apex. Inflorescence a terminal, and 1 or 2 lateral, open, compound, corymbose partial panicles from the

upper leaf-like bracts; bracts subtending partial panicles reduced, shorter than the panicle; partial panicles 8-20 (-25) × 5-15 cm, the spikelets borne on long, filiform pedicels (rays), solitary, or rarely in fascicles of 2, (30-) 40-100 per panicle; branches glabrous; bracteoles at base of panicle branches and spikelet pedicels linear, long-ciliate distally on margins; mature spikelets ellipsoid to ovoid-ellipsoid, 4-6 × 1-1.5 mm, acute to acuminate at apex, cuneate at base,the scales spirally imbricate, spreading at maturity; scales 8-11 per spikelet, thin, submembranous, with narrow scarious margin, brown to dark brown, glabrous, the greenish midcosta distinct, prolonged at apex as a 0.1-0.4 mm long scabrous awn, often bearing setiferous trichomes; fertile scales 5-7, oblong-ovate to ovate-lanceolate, 3.5-5 × 1.5-2 mm; sterile scales 3 or 4, ovate, 1-2.6 × 0.5-1.5 mm. Stamens 3, the anthers 1.5-2 mm long with a blunt apiculus at apex, truncate and minutely papillate at base; style distinctly 2-branched from middle to near base, the stigmas glabrous. Achene rounded-obovate to nearly orbicular, transversely rugulose-reticulate, achene body 1.1-1.2 × 0.9-1.1 mm, yellowish to stramineous or light brown; epidermal cells rectangular, vertically oriented; style base depressed-triangular, 0.5-0.6 × 0.9-1.1 mm, with truncate apex at point where style disarticulates, shallowly lobed on both sides at base; bristles absent.

Distribution: Endemic to the Guianas (Guyana and Suriname).

Habitat in the Guianas: Sand savanna, 200 m.

Specimens examined: GUYANA: Kuyuwini Landing, Kuyuwini River, Rupununi District, 200 m, 11 Feb 1991, *M.J. Jansen-Jacobs et al. 2556* (U, US). SURINAME: Zuidrivier, savanna near Kayser airstrip, 13 Aug 1963, *J.P. Schulz 10436* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 26 Sep 1967, *J.T. Wildschut & P.A. Teunissen 11799*

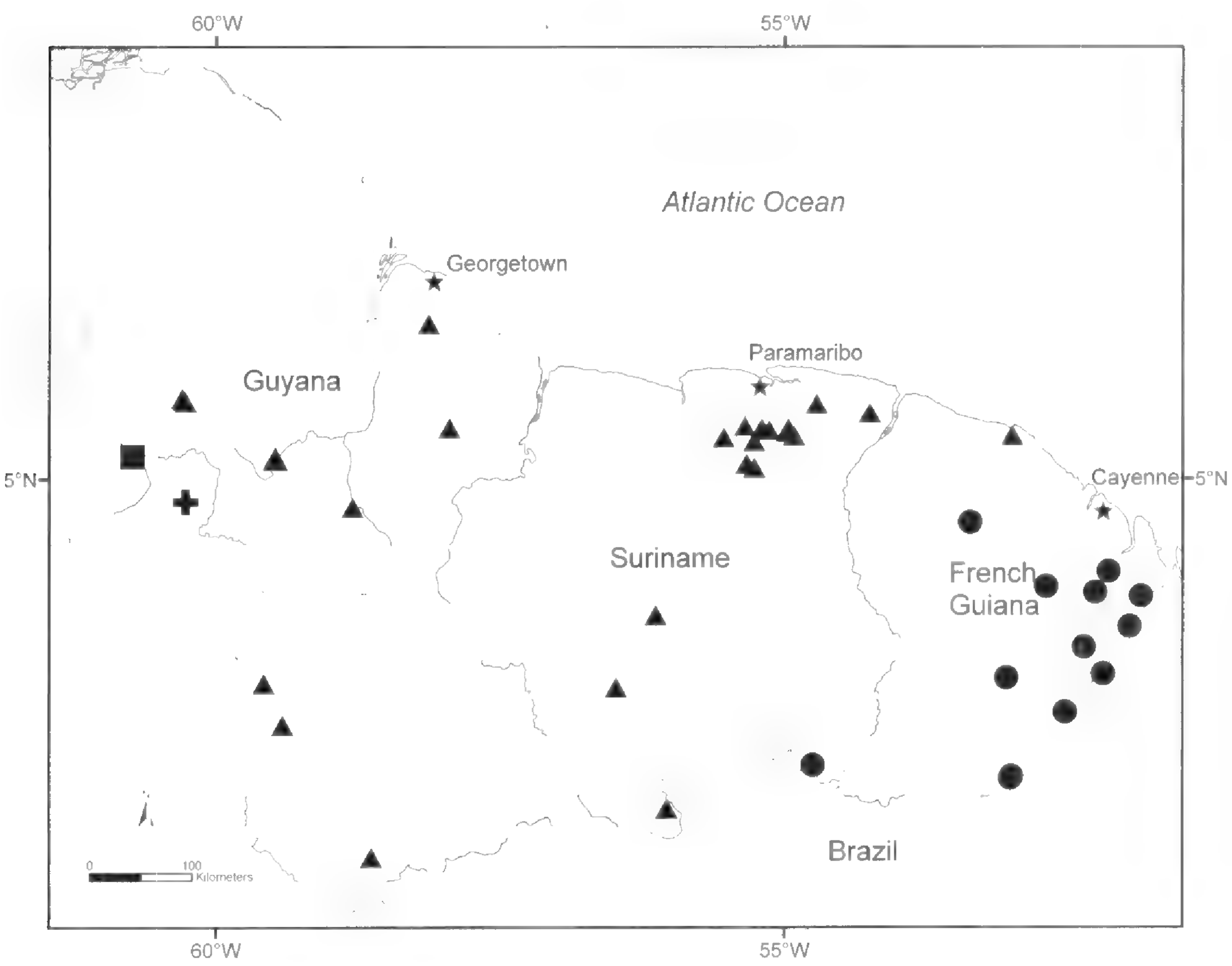

Fig. 43. Distribution of ■*Rhynchospora splendens*, ▲*R. spruceana*, ✚*R. steyermarkii*, and ●*R. subdicephala* in the Guianas.

(U); Natuurreservaat Brinkheuvel, (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 16 Jan 1968, *P.A. Teunissen & J.T. Wildschut 12185* (K, U); 2 km SW of airstrip "Sipaliwini", 20 Jan 1969, *F.H.F. Oldenburger & R. Norde 952* (U).

69. Rhynchospora subplumosa C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 34. 1908. LECTOTYPE: Guyana (British Guiana); [Pirara.], *Schomburgk 621* (K!; isolectotype fragment: B!), designated by T. Koyama, Mem. New York Bot. Gard. 23: 73. 1972. Figs. 44, 53C-D.

Rhynchospora trichochaeta var. *venezuelensis* Steyerm., Fieldiana, Bot. 28 (1): 49, f. 5H. 1951. TYPE: Venezuela; Bolivar, between Ciudad Bolivar and Rio Caroni, *Steyermark 57587* (holotype: F; isotype: NY).

Rhynchospora wallichiana sensu Boeckeler, Linnaea 38: 542. 1873, non Kunth, 1837.

Rhynchospora minor sensu Schnee, Bol. Soc. Venez. Ci. Nat. 9: 58, non (Nees) Steudel, 1855.

Rhizomatous perennial, 10-76 cm tall; rhizome well-developed, thickened, hard, often knotty, shortly horizontally creeping, 4-9 mm thick; roots medium to coarse, 0.3-1.3 mm thick; sheathing base of culm 8-15 mm wide. Culm solitary, erect or slightly ascending, 0.5-1.7 (-2) mm wide, trigonous to obtusely trigonous, slightly expanded at apex, hard, stiffened, coarsely ribbed, smooth, green, glabrous. Leaves numerous, primarily basal, rosette-like, 1 or 2 lower cauline, often a single reduced one midculm, 3-24 cm long; sheaths short, eligulate, herbaceous, very finely and closely veined, green, often tinged with pink, glabrous, inner band membranous, minutely cellular-reticulate, readily splitting and spreading open, the orifice truncate; blades linear-lanceolate to linear, (1.3-) 1.5-3.6 (-4) mm wide (flattened), stiffly ascending, often curving or wavy distally, V-shaped proximally near base, plicate or subplicate above, thickened-herbaceous, finely and closely veined abaxially, dull or semi-glossy, indistinctly veined and glossy adaxially, glabrous, margins and abaxial midvein finely and often closely antrorsely scabrous, acuminate to apex, the tip acute. Inflorescence a single hemispherical to globose head of spikelets at the summit of the culm, 7-17 × 9-20 mm; involucral bracts 4-6, leaf-like, much-reduced, ciliate scabrous on margins, the lowest 1 or 2 often equalling to twice exceeding inflorescence, up to 25 mm long; prophylls at base of spikelets with 2 ciliate-scabrous keels, ovate-rounded, obtuse to rounded at apex; spikelets 7-28, ovate-elliptic to ovate-lanceolate, 5-8.5 × 1.4-2.5 (-3) mm, cuneate at base, acute to obtuse at apex, the scales spreading with maturing achenes, to 3 mm wide; scales 8-11 per spikelet, dorsally acute to narrowly obtuse, thickly herbaceous except for terminal scales of spikelet which are thinly herbaceous to submembranous, smooth, semi-glossy to glossy, uniformly brown, often dark brown-lineolate at apex, glabrous, margins narrowly scarious or subscarious to not evidently so, midcosta hardly distinct, very fine, pale, ending in a minute mucro not prolonged beyond the acute apex; fertile scales 5-8, (2.8-) 3.5-7 (-7.5) × 2-3.3 mm, two lowermost ones subtending bisexual flowers (above the sterile), the terminal 3-6 of spikelet subtending staminate ones only, ovate-elliptic to lanceolate-elliptic or lanceolate except for the upper 3-6 terminal ones which are linear-lanceolate to linear and about 0.6-1 mm wide, the medial scales of rachilla with a short limb; sterile scales 3, sometimes subdistichous towards base, ovate to widely ovate or ovate-elliptic, 1.3-4.2 × 1.6-3.2 mm. Stamens 3, 2.3-3.6 mm long, cuneate at base, apiculate at apex, stipitate, the filaments often fused or adherent to each other in terminal staminate flowers of spikelet, free only at apex; style entire or shortly bifid at tip, often long-exserted and curling beyond apex of subtending scale. Achene 2-sided, involute, inrolled towards the adaxial side, with sinuate-corrugate margins, adaxially with a broad longitudinal ridge medially, abaxially (dorsally) obtuse to rounded, elliptic-obovate, 2.4-3.5 × (1-) 1.3-1.6 mm, short-acuminate at base, acute at apex, minutely punctate, with rounded to club-shaped nipple-like or bladder-like projections on both sides towards apex, pale brown to brown, dark brown to blackish at maturity, the corrugate margins a light yellowish brown; epidermal cells isodiametric with low-conic central nodules; style base subflattened or widely U-shaped in cross section, 0.7-1.5 (-1.7) mm long, 0.6-0.8 mm wide at its base, triangular-lanceolate, with a longitudinal medial ridge adaxially, acute to obtuse at apex, forming a sagittate base that is subconfluent with apex of achene, separated only by a fine rim, thin, brittle, brown, antrorsely-scabrous on margins; bristles 6, subulate, finely antrorsely barbed, plumose proximally with twany

ascending hairs, reddish, exceeding length of achene, equaling to exceeding tip of style base.

Distribution: South America (Colombia, Venezuela, Guyana, Suriname, and Brazil).

Habitat in the Guianas: Damp depressions and pond margins in white- and brown-sand savanna, 30-850 m.

Distinguishing features: The achenes of *R. subplumosa* and *R. trichochaeta* are very similar, but their plant habit is quite different. *Rhynchospora subplumosa* is a coarse perennial that has a short, thick and knotty, horizontal rhizome while *R. trichochaeta* is a small, caespitose annual with fibrous roots.

Specimens examined: GUYANA: Kanuku Mountains, Rupununi River, 1863-1864, C.F. Appun 1430 (K); Dadanawa, Rupununi River, 22 Dec 1914, *Melville Anderson 3* (K); Cow Pen, Canje River, Jan 1915, *Forestry Department British Guiana* (Herbarium) *120* (BRG, K-2); Berbice; Cattle trail, Waruni-Ituni Savannahs, Apr 1919, *A.A. Abraham 115* (K, NY, U); Dadanawa, Rupununi River, Rupununi District, 24 Feb 1931, E.B. Martyn, *Maj. T. Bone, Gov't Web. 356* (K); Rupununi, 1934, *Herbarium 63* (K); Oreala savanna, Corentyne River, 1931, *C.K. Bancroft 11* (K); Dada-nawa, Feb 1951, *H.P.C. Melville 1931* (BRG); Rupununi District, 2 mi. S of Lethem, 15 Apr 1956, *H.S. Irwin 638* (US); Waranama, Berbice River, Jun 1957, *K.O. Williams 85* (BRG); Ebini Experimental Station, Berbice River, 1 Apr 1958, *S.G. Harrison 673* (BRG, K); St. Ignatius, Rupununi, 16 Jul 1958, *S.G. Harrison 1289* (BRG, K); DWaranama Ranch, Berbice River, 22 Mar 1958, *S.G. Harrison 590* (BRG, K); Orinduik, Ireng River, Apr 1968, *D.H. Davis 708* (BRG, K, NY); North Rupununi, Apr 1968, *D.H. Davis 840* (BRG, K, NY); Waranama, Berbice, Oct 1973, *A. Cooper 92* (BRG, U); SE Kanuku Mountains, 03°04'N, 59°25'W, 250-350 m, 25 Jun 1989, *L.J. Gillespie et al. 1842* (NY, US); Kato and vicinity, SE of village, 04°40'N, 59°55'W, 750 m, 25 Mar 1989, *W. Hahn et al. 5802* (US); Sand Creek Village, 3 km E of junction of Rupununi & Katawau Rivers, 1 km S of village, 03°00'N, 59°31'W, 100 m, 21 Jun 1989, *L.J. Gillespie et al. 1703* (BM, CAY, G, NY, US); Orealla Amerindian settlement, + 1 km SW of landing, 05°20'N, 57°21'W, 30-50 m, 25 Apr 1990, *T. McDowell et al. 2498* (NY, US); Dadanawa, southern Rupununi Savanna, E side of Rupununi River, 02°50'N, 59°25'W, 110-120 m, 21 Aug 1995, *S.R. Hill et al. 27330* (US). SURINAME: Lobin-savanna inter Zanderij I and Hannover, Aug 1958, *J. van Donselaar & W.A.E. van Donselaar 397b* (U); Coesewijne Savanne, 12 Dec 1958, *J. van Donselaar 537* (U); Gros Savanne (prope km 103), 7 Apr 1959, *J. van Donselaar 678* (U); W-oever near Nickerier Rivier, 3 km N of Kamisavallen, 2 Jul 1965, *P.J.M. Maas & J.A. Tawjoeran LBB11039* (U); Nickerie Rivier, Kamisafalls, 2 Jul 1965, *P.J.M. Maas LLB11039* (NY); Brokopondo District, E of railroad, km 106, 13 Dec 1965, *J. van Donselaar 2746* (C, K, NY, U, US); Brokopondo District, E of Railroad, km 106, 16 Dec 1965, *J. van Donselaar 2781* (NY, U); Natuurreservaat Brinkheuvel, (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 5 Sep 1967, *J.T. Wildschut & P.A. Teunissen 11642* (U); Natuurreservaat Brinkheuvel (Brinkhill Nature Reserve), sabanpasi-savanne-complex, 27 Nov 1967, *P.A. Teunissen & J.T. Wildschut 11334* (CAY, U); Coesewijne Savanne, W part, 28 Mar 1977, *R. Jansma LBB15630* (U).

70. Rhynchospora tenella (Nees) Boeck., Linnaea 37: 595. 1873. *Holoschoenus tenellus* Nees in Martius, Fl. Bras. 2(1): 123. 1842. *Dichromena tenella* (Nees) Steud., Syn. Pl. Glumac. 2: 136. 1855. TYPE: Colombia; Vaupés, "ripa fluvii Apapuris prov, fluminis Nigri.", *Martius s.n.* (holotype: M). Figs. 45, 85A-B.

Rhynchospora tenella f. *haplostylis* Uittien, Recueil Trav. Bot. Néerl. 22: 337. 1925. *Rhynchospora tenella* var. *haplostylis* (Uittien) Kük., Bot. Jahrb. Syst. 75: 276. 1951. TYPE: Suriname; Teeboeberg, upper Tapanahoni River, *Versteeg 776a* (holotype: U!).

Caespitose annual, 2-40 cm long; roots medium to fine. Culms ascending, 0.2-0.8 mm wide, trigonous to triquetrous distally, with very narrow finely antrorsely scabrous wing angles, slender, very fine, soft, flexuous, finely ribbed, often channeled along one side distally, the edges of the channel finely scabrous, green, glabrous. Leaves numerous, ascending, primarily basal, 1-3 cauline, (1-) 2-23 cm long; sheaths eligulate, short, herbaceous, finely veined, pale brown proximally, green distally, glabrous, inner band membranous, the orifice U-shaped; blades narrowly linear, spreading V-shaped to folded, herbaceous, finely veined, green, glabrous, margins and abaxial midvein antrorsely scabrous, the apex long-

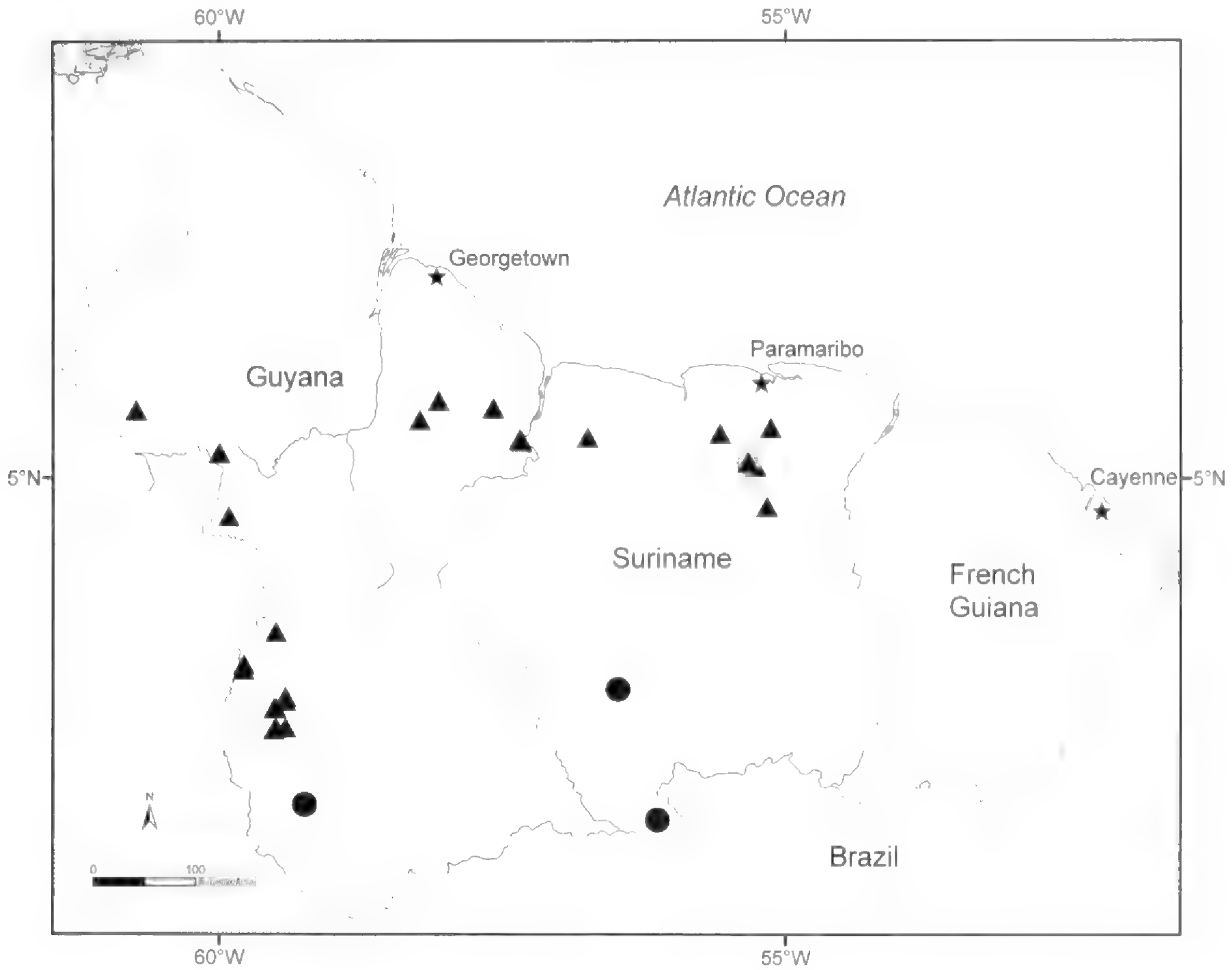

Fig. 44. Distribution of ●*Rhynchospora sublanata* and ▲*R. subplumosa* in the Guianas.

attenuate to triquetrous tip. Inflorescence a terminal and 1 or 2 lateral, open, simple to compound, corymbose partial panicles from the upper leaf-like bracts; bracts variable in length, generally shorter than leaf blades, shorter than to exceeding subtending partial panicle, to 10 cm long; terminal partial panicle largest, 2-13 × 1-7 cm, with 6-50 spikelets, lateral partial panicles becoming increasingly smaller proximally; branches flattened-trigonous or subterete, filiform, the spikelets borne singly at branch tips; spikelets ovoid-ellipsoid, 2.5-3.5 (-3.8) × (0.6-) 0.8-1.2 mm, acute to acuminate at apex, short-cuneate at base, scales spreading with maturing achenes; scales 6-8 per spikelet, dorsally obtuse to subrounded, lower fertile and sterile thickly herbaceous to subcoriaceous, upper fertile thinly herbaceous to submembranous, smooth, glossy or semi-glossy, uniformly dark brown or dark greenish brown, glabrous, margins narrowly whitish scarious on basal scales of spikelet, broadly whitish scarious with brown lineations on medium and distal scales of spikelet, midcosta very fine, pale or indistinct proximally, distinct near acute to narrowly acute apex, prolonged as a slightly recurved mucro or short awn; fertile scales 4 or 5, subobovate to ovate or widely ovate, 1.5-2.7 × 1.2-1.7 mm; sterile scales 2 or 3, ovate-elliptic to widely ovate-elliptic, 1-2.2 × 0.5-1.2 mm. Stamens 2, the anthers 0.4-0.7 mm long, apiculate at apex, truncate with minute lobes or papillae at base; style entire, exserted well beyond apex of subtending scale. Achene broadly biconvex to nearly globular, obovoid to globose-obovoid, widely obovoid, or obloid, 0.6-1 mm long and as wide, rounded at apex, subabruptly narrowed to short-stipitate base, transversely rugulose, cellular-reticulate at very base, shiny, light milky gray or light brown with darker gray or bluish flecks and/or mottling, pale brown when immature; epidermal cells linear,

vertically oriented; style base depressed-triangular or narrowly discoid, elliptic at base as seen from above, 0.1-0.2 mm long, 0.3-0.4 mm wide at base, brittle, brown; bristles absent.

Distribution: South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil).

Habitat in the Guianas: White- or brown-sand savanna, sandy clay savanna, seepages, granite inselbergs in "savane roche" (rock savanna) communities, rock outcrops, sandy open places, and open scrub, 150-1150 m.

Specimens examined: FRENCH GUIANA: Haut Oyapock, Mont St. Marcel, Grande savane roche sur la pente Sud Est, 400-450 m, 31 Jul 1975, *J.J. de Granville 2630* (CAY); Massif des Emerillons, versant Nord, 350 m, 20 Sep 1980, *J.J. de Granville 3920* (P); Montagne des Nouragues, Bassin de l'Arataye, 04°03'N, 52°42'W, 27 Aug 1987, *C. Feuillet 4369* (CAY); Montagne des Nouragues, Bassin de l'Arataye, face sud, 04°03'N, 52°42'W, 15 May 1988, *C. Sarthou 292* (CAY, NY); Roche Touatou, Bassin de L'Oyapock, Versant sud du Mont Touatou, 150 m, 02°57'N, 52°32'W, 18 May 1995, *G. Cremers 13977* (CAY, NY); Monts Bakra, 1.5 km à l'Ouest du Pic Coudreau, 550 m, 15 Jun 2002, *J.J. DeGranville et al. 14760* (CAY, GENT, K, NY, P, US). GUYANA: Kaieteur summit, 1100 ft, 31 Aug 1959, *B.A. Whitton 241* (K); Waranama, Berbice, Oct 1973, *A. Cooper 352* (U); Pakaraima Mts, Mt. Aymatoi, 1150 m, 05°55'N, 61°00'W, 15 Oct 1981, *P.J.M. Maas et al. 5675* (K, NY, U); Cucuya Creek, 1863-1864, *C.F. Appun 1022* (K); Utshe camp, 0.3 km N of Utshe River, just S of forest, 05°45'N, 61°08'W, 975 m, 22 May 1990, *T. McDowell & D. Gopaul 2740b* (US); Kaieteur Falls National Park, 05°12'N, 59°29'W, 500 m, 2 Apr 1988, *W.E. Hahn et al. 4075* (NY, US); Gunn's, Essequibo River, 240-260 m, 26 Sep 1989, *M.J. Jansen-Jacobs et al. 1839* (K, P, U, US); Gunn's, Essequibo River, 240-260 m, 3 Sep 1989, *M.J. Jansen-Jacobs et al. 1424* (B, CAY, K, MO, NY, U, US); Pakaraima Mountains, 0.5-1 km SE of Imbaimadai towards Partang River mouth, 05°42'N, 60°17'W, 525 m, 17 May 1992, *B. Hoffman et al. 1668* (US); Iwokrama International Rainforest Reserve, Iwokrama Mountains, summit of highest peak, 04°20'17"N, 58°46'50"W, 1000 m, 23 Sep 1996, *H.D. Clarke 2553* (US); Gunn's Strip, airstrip 2 km W of village & Essequibo River, 01°39'05"N, 58°38'50"W, 240 m, 18 Sep 1998, *H.D. Clarke et al. 7880* (US). SURINAME: Tafelberg (Table Mountain), Savanna 1, vicinity of Camp no 1, 565 m, 7 Aug 1944, *B. Maguire 24251* (F, K, NY, U, US); Maratakka Rivier, 8 Apr 1951, *J. Florschütz & P.A. Florschütz 1999* (U); Wilhelmina Gebergte, Zuid River, bordering Kayser airstrip, ca. 25 km above confluence with Lucie Rivier, 270 m, 03°20'N, 56°29'W, 2 Jul 1963, *B. Maguire et al. 53967* (NY); Maratakka Rivier, 2-3 km S of Saparra Kreek (East bank), 28 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3325* (U, US); 2-3 km S of Saparra Kreek, Maratakka O-oever, 28 May 1965, *P.J.M. Maas & J.A. Tawjoeran 3337* (U); Upper Tapanahoni Rivier, Teeboeberg, Sep, *G.M. Versteeg 776a* (U); Sipaliwini Savanne, 9 Sep 1966, *J. van Donselaar 3695* (U); Sipaliwini Savanne, 16 Sep 1968, *F.H.F. Oldenburger & R. Norde 984* (U).

71. Rhynchospora tenerrima Nees ex Spreng., Syst. Veg. 4 (Curae posteriores): 26. 1827. TYPE: West Indies; "Nov. Holl." [an error for West Indies], *Kohaut s.n.*, distributed as *F. Sieber agrost. no. 116* (holotype: AWH). Figs. 46, 82C-D.

Schoenus setaceus P. J. Bergius, Acta Helv. Phys.-Math. 7: 130, t. 9. 1772. *Rhynchospora setacea* Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1869: 159. 1869, non Vahl, 1805. *Spermodon setaceus* (P. J. Bergius) Nees, Linnaea 9: 296. 1834, comb. nud. emend. TYPE: Suriname, *D. Rolander s.n.* (holotype: C-Rottb).

Scleria setacea Poir. in Lamarck, Encycl. 7: 4. 1806. TYPE: Puerto Rico, *M. Ledru s.n.* (holotype: not located, probably at P).

[*Triodon setaceus* Rich. ex Kunth, Enum. Pl. 2: 280. 1837, *nom. in syn.*].

[*Schoenus spermodon* Schrad. ex Nees in Martius, Fl. Bras. 2(1): 118. 1842, *nom. in syn.*]

[*Schoenus filiformes* Lindl. ex Nees in Martius, Fl. Bras. 2(1): 118. 1842, *nom. in syn.*]

Rhynchospora spermodon Griseb., Fl. Br. W. I. 576. 1864. TYPE: Jamaica, in dry pastures, *Wullschlaegel s.n.* (holotype: GOET).

Caespitose annual, 7-55 cm tall; roots fine to medium. Culms ascending, 0.3-0.8 mm wide, obtusely trigonous, soft, flexuous, finely ribbed, longitudinally channeled along one side distally, minutely punctate distally, green, glabrous. Leaves numerous, ascending, primarily basal, 1-3 cauline, 3-36 cm long; sheaths eligulate, short, scarcely

inflated, herbaceous, finely veined, pale brown, glabrous, inner band membranous, turning reddish brown with age, the orifice truncate to concave; blades filiform, 0.3-1.3 (-1.4) mm wide, crescentiform-involute proximally, triangular-channeled distally, herbaceous, finely veined, minutely punctate, at least distally, pale green, glabrous, margins essentially smooth proximally, antrorsely scabrous at apex, long-attenuate to triquetrous or subflattened apex. Inflorescence a terminal and 1-3 lateral, small, contracted, corymbose partial panicles from the upper leaf-like bracts; bracts on terminal panicle equaling to 3 times length of subtending panicle, to 6 cm long; terminal panicle 7-15 × 4-14 mm, the spikelets (1-) 2-10, rather congested; branches short, obtusely trigonous, subterete or crescentiform-capillary; spikelets narrowly ovoid-ellipsoid to ellipsoid-lanceoloid, 5-6 × 0.9-1.8 mm, acuminate at apex, cuneate at base, scales spreading with maturing achenes; scales 5-11 per spikelet, obtusely angled dorsally, becoming subrounded with developing achenes, sterile and lower fertile scales thinly coriaceous, glabrous, glossy, somewhat uniformly light brown to brown, with darker reddish brown lineations, upper fertile scales submembranous, dull, margins broadly scarious with reddish lineations, midcosta very fine, pale, extending beyond acute to acuminate apex of scale as a 0.5-1 mm long antrorsely scabrous awn; fertile scales 3-6, ovate-elliptic to ovate-lanceolate, (2.7-) 3-4.8 (-5) × 1-2.8 mm; sterile scales 2-5, ovate to ovate-elliptic or elliptic-obovate, 1.5-3.5 × 0.5-2 (-2.4) mm. Stamens 2, the anthers 1-1.6 mm long, apiculate at apex, truncate with minute crystalline protuberences at base; style base 2-branched, $^2/_3$ to equaling length of unbranched portion. Achenes biconvex, obovate, 1.5-1.8 × 1.1-1.5 mm, margins at apex flaring, prolonged into an ear-like projection on each side that is confluent with margins of style base, abruptly narrowing to a narrow, whitish

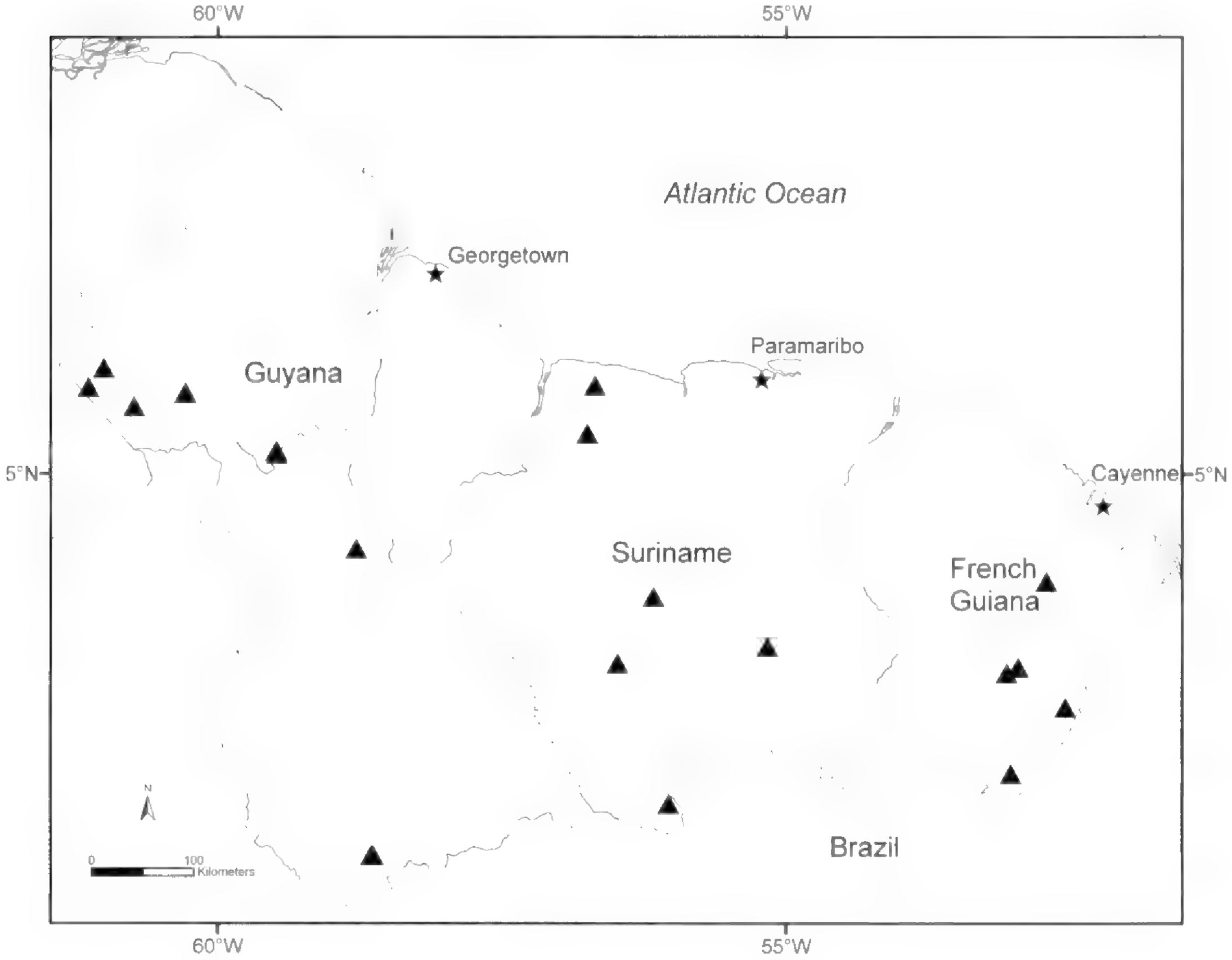

Fig. 45. Distribution of *Rhynchospora tenella* in the Guianas.

translucent, cellular-reticulate stipe at base, transversely rugose medially, widely cellular-reticulate-papillate on margins, pale brown to brown, often with a gray or reddish longitudinal stripe medially; epidermal cells linear, vertically oriented; style base tounge-like, dilated at the tip as seen from dorsal or front view, pyramidal as seen from lateral view, decurrent along edges of apical ears of achene, 0.4-0.6 × 0.2-0.3 mm, soft, brittle, brown to brownish black; bristles absent.

Distribution: Southern Mexico, Central America (Guatemala, Honduras, Nicaragua, and Panama), Greater Antilles (Cuba, Hispaniola, and Puerto Rico), Lesser Antilles, Trinidad, and South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, and Bolivia).

Habitat in the Guianas: Generally in wet places; depressions in savanna, swampy areas, creek beds, lowland wet forest, palm swamps, trails, roadsides, and disturbed areas, 10-270 m.

Distinguishing features: See *R. fallax* for discussion of differences between these two taxa.

Specimens: examined: FRENCH GUIANA: Without locality, 1819-1821, *M. Poiteau s.n.* (C); Without locality or date, *J. Martin s.n.* (BM); Cayenne, Without date, *M. Perrottet s.n.* (C); Cayenne, 1835, *M. Leprieur s.n.* (C); Without locality, 1840, *M. Leprieur s.n.* (C); Cayenne, Mar 1859, *P. Sagot 1351* (BM, K); Without locality, 1867, *W. Parker s.n.* (K); vicinity of Cayenne, 14 Jun 1921, *W.E. Broadway 493* (K); Cayenne, 1867, *H. Jelski s.n.* (B); vicinity of Cayenne, 30 May 1921, *W.E. Broadway 341* (NY, US); à 4 km au SE de Tonate, 30 Aug 1979, *A. Raynal-Roques 21515* (CAY); Pripris Maillard, à 4 km au SE de Tonate, 30 Aug 1979, *A. Raynal-Roques 21515* (P, US); St. Elie track, NW of Sinnamary, along trail beyond km marker 23, W of ORSTOM "Ecerex" project, ca. 250 m, 05°30'N, 48°00'W, 6 Jul 1982, *T.B. Croat 53837* (CAY-2); Entre Kourou et Sinnamary, PK 92, 13 Aug 1982, *A. Fournet 264* (CAY-2); Along Route D9 to Mana, 05°33'N, 53°56'W, 10-30 m, 18 Nov 1986, *L.E. Skog et al. 7448* (US). GUYANA: Penal Settlement, on W side of Essequibo River, near mouth of Mazaruni River, 3 Dec 1919, *A.S. Hitchcock 17042* (US); Mazaruni Station, Feb 1939, *Forestry Department British Guiana 93* (K, U); Mazaruni Station, Feb 1939, *Forestry Department British Guiana M93* (K, U); Mazaruni Station, 24 Jun 1945, *Forestry Department British Guiana M380* (K); Mazaruni Station, 24 Jun 1945, *Forestry Department British Guiana 380* (K); Waranama Ranch, Berbice River, 5 *Jun 1958, S.G. Harrison 1014* (K); vicinity of Aishalton Hospital, 20 Nov 1982, *A.L. Stoffers et al. 495* (US); South Rupununi savanna; Aishalton village, 02°31'N, 59°20'W, 200 m, 3 Aug 1994, *T.W. Henkel R. James 3979a* (US); along highway to Linden (Mackenzie), at stream, 7.3 km S of junction with highway to Timehri Airport, 06°30'N, 58°10'W, 20-50 m, 16 Aug 1995, *C.N. Horn & S. Hill 10064* (US); Rupununi Northern Savanna, Pirara head waters, NW of Yupukari, 03°40'N, 59°30'W, ca. 80 m, 22 Oct 1996, *C.N. Horn & J. Wiersema 11059* (US). SURINAME: Prope Paramaribo, Mar 1838, *F.L. Splitgerber 604* (U); Near Kwatta, W of Paramaribo, Aug 1954, *J.C. Lindeman 6562* (U); Van Hattumweg II, 19 Sep 1958, *Ir J.G.P. Dirven LP688a* (U); Van Hattumweg 8, 9 Sep 1959, *Ir J.G.P. Dirven LP675* (U); S of Paramaribo, Pad van Wanica 133, Agricultural Experimental Station, 23 Sep 1959, *Ir J.G.P. Dirven 710* (K); Nepveu, Javaweg, 1 Oct 1959, *Ir J.G.P. Dirven LP662* (U); Rad van Wanica (d1P), 2 Oct 1959, *Ir J.G.P. Dirven LP718* (U); Kayser Gebergte Airstrip, south central Suriname, 45 km above confluence with Lucie Rivier, 2 Dec 1961, *R. Freund & S.Freund 1b* (US); Zuid Rivier Savanne, bij Kayser vliegveld, 13 Aug 1963, *J.P. Schulz 10437* (U); Zuid Rivier, vicinity Kayser airstrip, 45 km above confluence with Lucie Rivier, 270 m, 29 Aug 1963, *H.S. Irwin et al. 55283* (US); Sipaliwini Savanne, Brazilian frontier, 10 Oct 1968, *F.H.F. Oldenburger et al. 253* (K, U, US); Sipaliwini Savanne, 29 Dec 1968, *F.H.F. Oldenburger & R. Norde 648* (U); Sipaliwini Savanne area on Brazilian frontier, southern part, 25 Jan 1969, *F.H.F. Oldenburger & R. Norde 850* (U); Experimental farm Coebiti, 14 Jun 1984, *A.P. Everaarts 938* (U).

72. Rhynchospora tenuis subsp. **austrobrasiliensis** T. Koyama, Mem. New York Bot. Gard. 23: 78. 1972. TYPE: Brazil; São Paulo, Parque do Estado, São Paulo, humid place, *Hoehne 27416* (holotype: NY!; isotypes: SP, US!). Figs. 47, 85E-F.

Holoschoenus capillaris var. *minor* Nees in Martius, Fl. Bras. 2(1):121. 1842. TYPE: Brazil; A Campis rudis prov. Minarum Generalium et S. Pauli, *Martius 3367* (holotype: M).

Caespitose perennial, 10-30 cm tall; rhizome short, the culms and numerous basal leaves forming

very dense clumps; roots fine to medium, brown. Culms ascending, 0.3-1 mm wide, obtusely trigonous to compressed-trigonous or subterete, often with sulcate sides proximally, soft, flexuous, finely ribbed, channeled along one side distally, pale green, glabrous. Leaves ascending, numerous, primarily basal, 1-3 cauline, 4-23 cm long; sheaths quite long, particularly cauline ones, closely clasping culm, essentially eligulate, sometimes a faint rim of tissue present at adaxial junction of sheath and blade, herbaceous, finely ribbed, pale brown to stramineous proximally, glabrous, the inner band membranous on basal sheaths, herbaceous on upper cauline sheaths except for membranous orifice, with truncate to slightly concave orifice; blades narrowly linear, 0.2-1.2 mm wide (unfolded), V-shaped to subfolded or sometimes involute, flexuous, herbaceous, finely veined abaxially, smooth, semi-glossy and minutely cellular-reticulate adaxially, light green or pale brown abaxially, green adaxially, glabrous, margins smooth proximally, antrorsely scabrous distally, the apex long-acuminate, triquetrous near tip. Inflorescence a series of 1-3 (4) corymbose partial panicles from the upper leaf-like bracts; panicles lax with spreading branches or somewhat strict, the terminal panicle 0.5-3 × 1-4 cm, with 20-150 spikelets; bracts often setaceous, shorter and a little narrower than leaf blades, to 10 cm long, overtopping their subtending panicles; branches very slender and filiform, obtusely trigonous, flattened-trigonous or subterete in cross section; spikelets ovoid-ellipsoid, 2.5-3.5 (-4) × 0.6-1.3 mm, narrowly acute to acuminate at apex, often falcate, short-cuneate at base, the scales spreading with maturing achenes; scales dorsally obtuse to rounded, herbaceous, distal scales of spikelet thinly herbaceous to submembranous, minutely cellular-striate, semi-glossy, brown or reddish brown with slightly darker brown

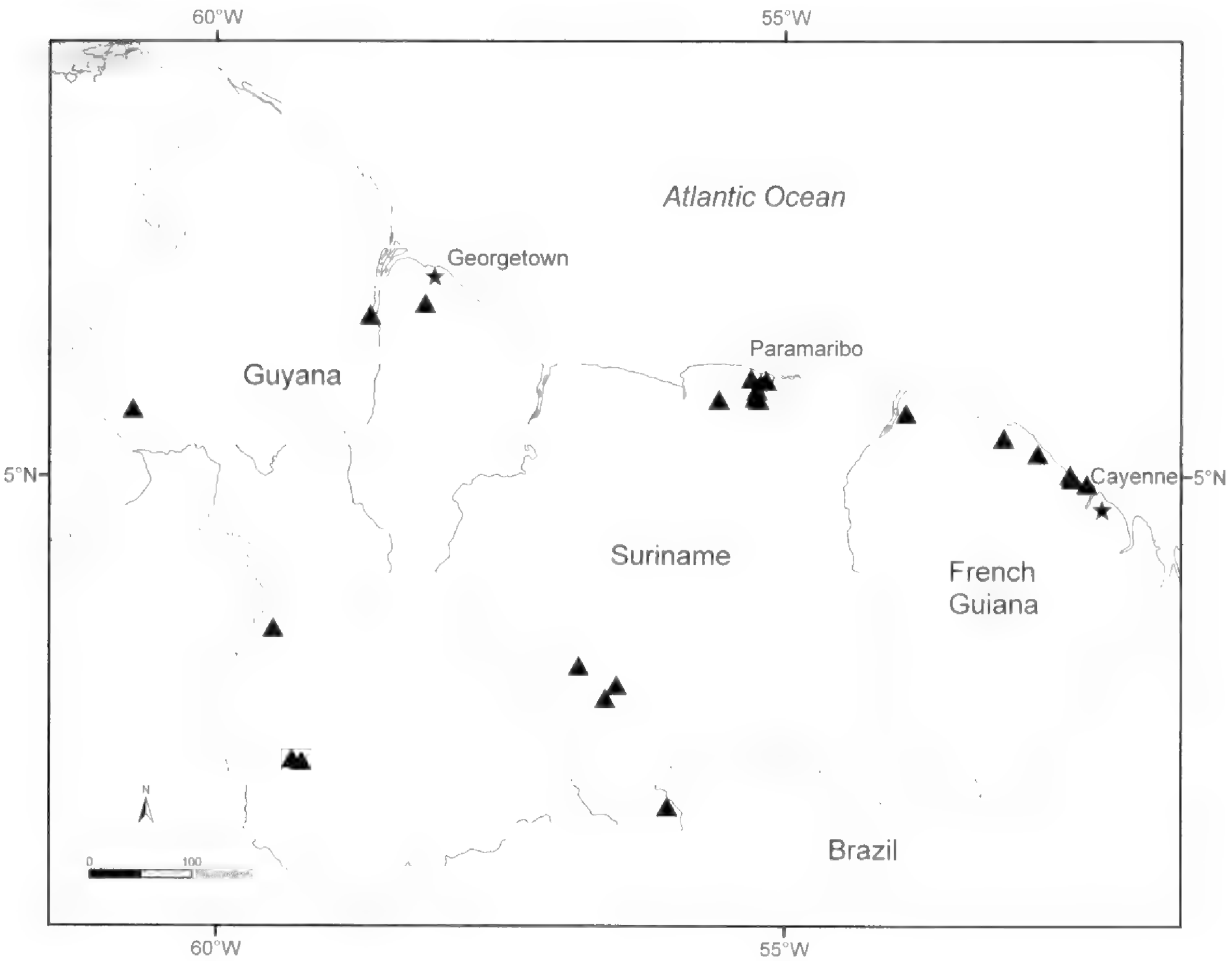

Fig. 46. Distribution of *Rhynchospora tenerrima* in the Guianas.

lineations, glabrous, margins broadly scarious, brown-lineolate, slightly crisped, midcosta very fine, indistinct except at apex, prolonged beyond the narrowly acute to acuminate apex as a short mucro; fertile scales 3 or 4, ovate-elliptic or widely ovate-elliptic to ovate-lanceolate, 1.5-3 × 0.8-1.4 mm; sterile scales 2 or 3 at base of spikelet, ovate-elliptic, 0.7-1.5 × 0.3-1.2 mm. Stamens 3, the anthers 0.8-1.2 mm long, minutely lobed at base, apiculate-papillate at apex; style 2-branched, equaling to $^2/_3$ length of unbranched portion, long-exserted from subtending scale, one branch often shorter than the other. Achene biconvex, depressed-obovate or rounded-obovate, 0.6-0.9 × 0.8-1 mm, broadly rounded to truncate at apex, short-cuneate at base, transversely rugulose with 5 or 6 rugae per face, narrowly cellular-reticulate along margins and at base, shining, glossy, reddish brown or brown; epidermal cells linear, vertically oriented; style base shallowly triangular, 0.2-0.4 × 0.5-0.7 mm, shallowly 2-lobed at base, the lobes shortly extending along shoulders of achene, pale brown to brown or blackish; bristles absent.

Distribution: South America (Guyana and Brazil).

Habitat in the Guianas: Generally in moist to wet sands of open savanna habitats, including white-sand savanna, seepages, depressions, borders of creeks and streams, and palm swamps, 200-850 m.

Distinguishing features: This subspecies of *Rhynchospora tenuis* differs from the typical subspecies in its smaller habit, often falcate spikelets, and shorter (0.6-0.9 mm long vs. 1-1.4 mm long) depressed-obovate or rounded-obovate achenes (vs. obovate in *R. tenuis*).

Specimens examined: GUYANA: Rupununi savanna, 24 Jun 1952, *Ir J.G.P. Dirven LP193* (U); Turuk Wau Hill, Rupununi, 26 Oct 1957, *C.D.K. Cook 34* (K); vicinity of Aishalton Hospital, 20 Nov 1982, *A.L. Stoffers et al. 487a* (NY, U); SE Kanuku Mountains, 03°04'N, 59°25'W, 250-350 m, 25 Jun 1989, *L.J. Gillespie et al. 1866* (NY, US); South Rupununi savanna, Aishalton village, 02°31'N, 59°20'W, 200 m, 3 Aug 1994, *T.W. Henkel & R. James 3985* (NY, US); Rupununi Northern Savanna, Runway Pond, about 3 mi. NW of Karanambo, 03°45'N, 59°10'W, ca. 80 m, 21 Oct 1996, *C.N. Horn & J. Wiersema 11027* (US).

73. Rhynchospora tenuis subsp. **tenuis** Willd. ex Link in Sprengel, Schrader, and Link, Jahrb. Gewächsk. 1(3): 76. 1818. *Dichromena linkii* J. F. Macbr., Publ. Field Mus. Nat. Hist. Bot. Ser. 11: 5. 1931, *nom. nov.*, non *Dichromena tenuis* Steud., 1855. TYPE: Brazil, *Humboldt s.n.* (holotype: B-Willd. 1135, fol. 1, microfiche US ex B). Figs. 47, 85C-D.

Fuirena gracilis Spreng., Novi Provent. 46. 1819. *Dichromena gracilis* (Spreng.) Kunth, Enum. Pl. 2: 280. 1837. *Rhynchospora gracilis* (Spreng.) Kuntze, Revis. Gen. Pl. 3(2): 335. 1898. TYPE: Brazil, *Otto s.n.* (holotype: B, destroyed).

Spermodon curvulus Nees in Martius, Fl. Bras. 2(1): 119. 1842. *Rhynchospora curvula* (Nees) Boeck., Linnaea 37: 596. 1873. TYPE: Brazil, A Campis editis prov. Minarum, *Martius s.n.* (holotype: M).

Caespitose perennial, (10-) 14-40 (-50) cm tall; rhizome short, the culms and numerous basal leaves forming dense clumps; roots fine to medium, brown. Culms ascending, 0.4-0.9 mm wide, obtusely trigonous to compressed-trigonous or subterete, soft, flexuous, finely ribbed, channeled along one side distally, pale green, glabrous. Leaves ascending, numerous, primarily basal, 1-3 cauline, 6-40 cm long; sheaths quite long, particularly cauline ones, closely clasping culm, essentially eligulate, sometimes a faint rim of tissue present at adaxial junction of sheath and blade, herbaceous, finely ribbed, pale brown to stramineous proximally, glabrous, the inner band membranous on basal sheaths, herbaceous on upper cauline sheaths except for membranous orifice, with truncate to slightly concave orifice; blades narrowly linear, 0.3-1.1 mm wide (unfolded), V-shaped to subfolded or sometimes involute, firm, herbaceous, finely veined abaxially, smooth, glossy and minutely cellular-reticulate adaxially, light green or pale brown abaxially, green adaxially, glabrous, margins smooth proximally, antrorsely scabrous distally, the apex long-acuminate, triquetrous near tip. Inflorescence a series of 1-3 (4) corymbose partial panicles from the upper leaf-like bracts, panicles somewhat strict, the terminal panicle 1-5 × 1-2 cm, with 10-50 spikelets; bracts shorter and a little narrower than leaf blades, to 20 cm long; branches very slender and filiform, obtusely trigonous, flattened-trigonous or subterete in cross section; spikelets ovoid-ellipsoid, 3-5 × 0.6-1.3 mm, narrowly acute to acuminate at apex, straight, becoming slightly falcate with age, the

scales spreading with maturing achenes; scales dorsally obtuse to rounded, herbaceous, distal scales of spikelet thinly herbaceous to submembranous, minutely cellular-striate, semi-glossy, reddish brown with slightly darker brown lineations, glabrous, margins narrowly scarious, slightly crisped, midcosta very fine, indistinct except at apex, prolonged beyond the narrowly acute to acuminate apex as a short mucro; fertile scales 3 or 4, ovate-elliptic or widely ovate-elliptic to ovate-lanceolate, 2.2-3.8 × 0.9-1.6 mm; sterile scales 2 or 3 at base of spikelet, ovate-elliptic, 0.7-1.7 × 0.3-1.2 mm. Stamens 3, the anthers 0.8-1.2 mm long, minutely lobed at base, apiculate-papillate at apex; style 2-branched, equaling to 2/3 length of unbranched portion, long-exserted from subtending scale, one branch often shorter than the other. Achene biconvex, obovate, 1-1.4 × 0.8-1 mm, truncate at apex, cuneate at base, transversely rugulose with 6-8 rugae per face, narrowly cellular-reticulate along margins and at base, shining, glossy, reddish brown or brown; epidermal cells linear, vertically oriented; style base shallowly triangular, 0.2-0.6 × 0.5-0.7 mm, 2-lobed at base, the lobes extending along shoulders of achene, brown or blackish; bristles absent.

Distribution: Mexico, Central America (Guatemala, Honduras, Nicaragua, and Panama), Bahamas, Greater Antilles (Cuba, Hispaniola, and Jamaica), Lesser Antilles, Trinidad, and South America (Colombia, Venezuela, Guyana, Brazil, Paraguay, Uruguay, Bolivia, and northern Argentina).

Habitat in the Guianas: In savanna.

Note: Kükenthal (1950) cites six specimens of this taxon from Suriname. Two of these that I have seen, *Essed 95* and *Boldingh 3843*, at U are *R. riparia*. I could not locate the other four.

Specimens examined: GUYANA: Charwair Creek, near mouth, Rupununi River basin, in moist places, savanna, 1-4 Nov 1937, *A.C. Smith 2337* (F, G, K, NY, U, US).

74. Rhynchospora tepuiana Steyerm., Fieldiana, Bot. 28(1): 48. f.5G. 1951. *Rhynchospora flexuosa* subsp. *tepuiana* (Steyerm.) T. Koyama, Mem. New York Bot. Gard. 23: 48. 1972. TYPE: Venezuela; Bolivar, Mount Roraima, forested SW-facing quebrada near Rondón Camp, 2040 m, *Steyermark 58652* (holotype: F; isotypes: NY!, US!). Figs. 47, 69A-B.

Rhynchospora tenerrima Boeck., Linnaea 37: 554. 1873, *nom. illeg.*, non Nees ex Sprengel, 1827. *Rhynchospora flexuosa* var. *tenerrima* Kük., Bot. Jahrb. Syst. 75: 153. 1950. TYPE: Venezuela; Caracas, *Gollmer s.n.* (holotype: B, destroyed).

Slender rhizomatous perennial, 6-35 cm long, the culms crowded along short horizontally creeping rhizome; roots fine; sheathing base of culm slender, 0.5-1.5 mm wide. Culms ascending, 0.2-0.3 (-0.4) mm wide, filiform, obtusely trigonous to subterete, firm but flexible, finely ribbed, green, glabrous. Leaves basal and lower cauline, the lowermost with short blades or blades wanting, ascending, becoming wavy or curled with age, 4-6 per culm, (3-) 5-25 cm long; sheaths eligulate, herbaceous, finely veined abaxially, stramineous to pale brown, glabrous, the inner band membranous with truncate orifice, often encircling 2/3 of culm distally, pale reddish brown, purple-dotted, often dark brown distally at maturity; blades filiform, crescentiform-involute to subterete distally, 0.2-0.3 mm wide, herbaceous, finely veined, green, essentially glabrous, margins antrorsely scabrous to essentially smooth, subterete distal portion of blade articulated, with triquetrous or subflattened blade above the articulation, this antrorsely scabrous on margins, attenuate to tip. Inflorescence a terminal and 1 or 2 lateral, short peduncled fascicles of spikelets at the apex of the culm, often a remote second group of fascicles below; bracts greatly overtopping fascicles of spikelets, to 15 cm long, 0.2-0.3 mm wide; fascicles 5-10 × 3-9 mm; peduncles trigonous to flattened-trigonous or subplano-convex; spikelets (1-) 2-12 per group of fascicles, ovoid-ellipsoid, acute at apex, cuneate at base, 3.2-4.5 (-4.8) × 0.8-1.4 mm, spreading with maturing achenes (becoming wider); scales 7-11 per spikelet, submembranous, dorsally rounded in cross section, with entire narrowly scarious margins, reddish or yellowish brown with dark brown lineations, glabrous, midcosta narrow, wire-like, light brown proximally, dark brown distally, antrorsely scabrous on proximal scales of spikelet, extending beyond narrowly rounded to acute apex of scale as a short mucro, the lowermost sterile scales with short awn; fertile scales 4-6, oblong-ovate, 2-2.8 × 1.2-2 (-2.2) mm; sterile scales 3-4 (-5), ovate to oblong-ovate or ovate lanceolate, (1-) 1.2-2.3 × 0.6-1.2 (-1.4) mm. Stamens 1 (-2), the anthers 1

mm long, apiculate at apex, truncate and minutely lobed at base; style distinctly 2-branched, the branches as long as or two times length of unbranched portion. Achene subflattened-convex, oblong-obovate, 1.2-1.4 (-1.5) mm long (including short-stipitate base), 0.6-0.9 mm wide, finely and weakly transversely rugulose, shiny, deep brown or yellowish brown with each epidermal cell showing a reddish or brownish spot, short-stipitate at base, apex rounded to subtruncate, the margins entire, very narrow, spinulose at apex; epidermal cells linear, vertically oriented; style base depressed-triangular or subflattned-discoid, 0.2-0.4 mm long, 0.3 mm wide at base, crustose, pale brown; bristles 5 or 6, filiform, antrorsely barbed, dark reddish brown, shorter than to ½ length of achene body, sometimes 1 or 2 rudimentary.

Distribution: Endemic to the Guyana Shield (Venezuela and Guyana).

Habitat in the Guianas: Summit and slopes of Mts. Roraima and Wokomung in the Pakaraima Mountains, 1560 m.

Discussion: Koyama (1972) recognized this species as a subspecies of *Rhynchospora flexuosa* C. B. Clarke of southeastern Brazil. Although *R. tepuiana* is closely related to that plant, it differs in a number of consistent characters. The spikelets of *R. tepuiana* are slightly smaller than those of *R. flexuosa* and the spikelet scales are generally lighter in color (reddish or yellowish brown vs. dark brown in *R. flexuosa*). As Koyama (1972) noted, achenes of *R. tepuiana* are oblong-obovate and weakly transversely rugulose while those of *R. flexuosa* are obovate to elliptic-obovate and strongly transversely rugulose. In addition to these characters, I have noted that achenes of *R. tepuiana* are subflattened-convex in cross section while those of *R. flexuosa* are distinctly bi-convex and thicker than *R. tepuiana* in cross section.

Specimens examined: GUYANA: Mt. Roraima (Our House), 05°12'N, 60°44'W, 15 Dec 1884, *E.F. im Thurn 253* (BM, K, US); Mt. Roraima, 'Our House', 15 Dec 1884, *G.S. Jenman 253* (US); Mt. Wokomung, summit, 05°04'03.3"N, 59°51'41.8"W, 1560 m, 10 Jul 2003, *H.D. Clarke et al. 10703* (US).

75. Rhynchospora trichochaeta C. B. Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 89. 1908. *Trichochaeta tenuis* Steud., Syn. Pl. Glumac. 2: 156. 1855, non *Rhynchospora tenuis* Willd. ex Link, 1820. *Rhynchospora mexicana* var. *trichochaeta* (C. B. Clarke) Kük., Bot. Jahrb. Syst. 56(Beibl. 125): 16. 1921. TYPE: Brazil, *Gardner 2385* (holotype: K!; isotypes: BM!, NY, fragment US!). Figs. 48, 53A-B.

Rhynchospora denticulata Huber, Bol. Mus. Paraense Emilio Goeldi 5: 317. 1909. TYPE: Brazil; Para, Alto Ariramba, *Ducke 8016* (holotype: MG).

Caespitose annual, 6-42 cm tall; roots medium to coarse, 0.5-1.5 mm thick. Culms erect to ascending, 0.3-1 (-1.1) mm wide, trigonous to flattened-trigonous, often triquetrous distally with narrow wing-angles, the angles often scabrous or setose-scabrous distally, firm but flexuous, finely ribbed and channeled, often more deeply channeled along one side distally, the edges of the channel bluntly antrorsely scabrous distally, green, glabrous. Leaves numerous, ascending, primarily basal, 1 or 2 lower cauline, 3-28 cm long; sheaths eligulate, short, herbaceous, bases on larger plants often somewhat spongy-thickened, distinctly finely and closely veined, very finely cellular-papillate along base of veins, dark green, often finely black-dotted proximally, glabrous, inner band membranous, distinctly very finely cellular-reticulate, reddish brown proximally, the orifice truncate; blades very narrowly linear, appearing filiform, 0.3-2.7 mm wide (flattened), involute, or sometimes subflattened proximally, herbaceous, distinctly closely veined and dull abaxially, finely cellular-reticulate and semi-glossy to glossy adaxially, green, glabrous, margins smooth proximally, antrorsely scabrous distally, long-attenuate to filiform, triquetrous apex. Inflorescence a single hemispherical to subglobose head of congested spikelets at the summit of the culm, 5-12 × 5-16 mm, with 5-28 spikelets; involucral bracts reduced, scale-like to leaf-like (lowermost), the lowest often exceeding the inflorescence head, long-ciliate on margins proximally, to 3 cm long; spikelets lanceolate-elliptic, 5-6.7 (-7) × 1.2-1.8 (-2) mm, acute to subobtuse at base, acuminate at apex, the scales 6 per spikelet, spreading with developing achenes; scales acute to obtuse or subrounded dorsally, thickly herbaceous except for terminal scales of spikelet which are thinly herbaceous to submembranous, inrolled, often the uppermost 2 empty, the terminal one hyaline at apex, smooth, glossy, uniformly light brown or yellowish brown,

glabrous, margins narrowly scarious, midcosta very fine, inconspicuous proximally, green at apex, minutely and bluntly antrorsely scabrous at tip, the tip not prolonged beyond the acute to acuminate apex; fertile scales 3, 1 or 2 subtending bisexual flowers, the terminal 1 or 2 scales of spikelet empty, widely ovate-elliptic to lanceolate-elliptic, except for the upper 3-6 terminal ones which are linear-lanceolate to linear and about 1 mm wide, medial scales of rachilla with a short limb, abruptly narrowed near base, 3.1-6 × 1.3-2.8 mm; sterile scales 3, sometimes subdistichous towards base, widely ovate to ovate-deltate, often as wide or slightly wider at base than long, 1.2-2.9 × 1.2-2.3 mm. Stamens 3, the anthers 1.3-2.5 mm long, apiculate at apex, acuminate at base; style entire, sometimes shortly bi-lobed at tip, long-exserted and curling beyond apex of subtending scale. Achene U-shaped or involute, inrolled towards the adaxial side with strongly sinuate-corrugate margins, oblong-obovate, 2.1-3 × 1-1.3 mm, truncate at apex, cuneate at base, finely cellular-papillate, tuberculate dorsally, grayish brown; epidermal cells isodiametric with buttressed, low-conic central nodules; style base triangular-lanceolate, flattened, tounge-like, 1-1.6 mm long,

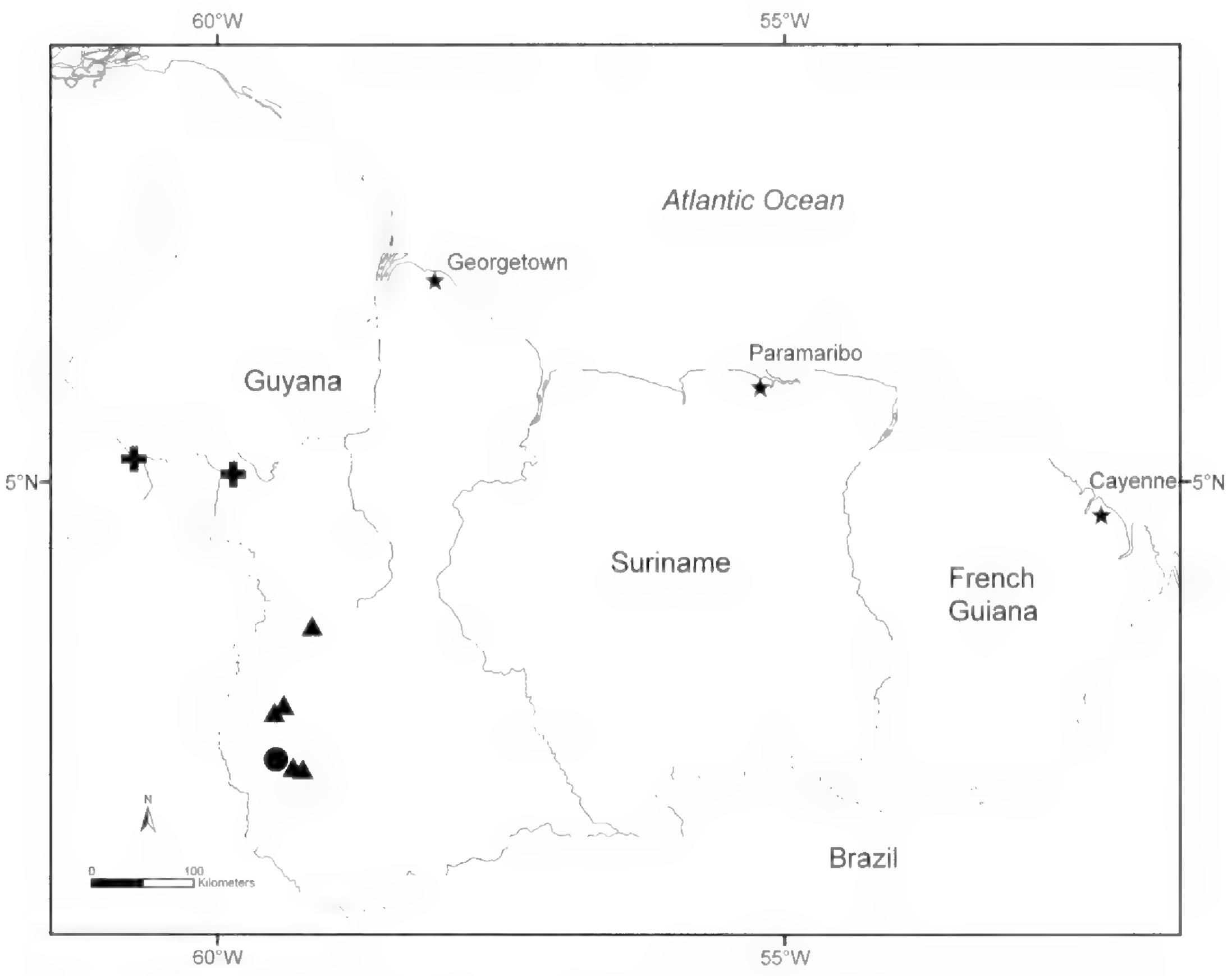

Fig. 47. Distribution of ▲*Rhynchospora tenuis* subsp. *austrobrasiliensis*, ●*R. tenuis* subsp. *tenuis*, and ✚*R. tepuiana* in the Guianas.

0.5-0.8 mm wide at base, brittle, light brown, margins slightly inrolled at base; bristles 6, filiform, 3.5-5.2 mm long, finely antrorsely barbed, plumose with tawny trichomes from base to about ½ length of bristle, reddish to reddish brown.

Distribution: South America (Colombia, Venezuela, Guyana, French Guiana, and Brazil).

Habitat in the Guianas: Savanna and lateritic rock outcrops, often bordering rivers and streams, 200-700 m.

Distinguishing features: See discussion under *R. subplumosa*.

Specimens examined: FRENCH GUIANA: Roche Touatou, Bassin de l'Oyapock, versant sud du Mont Touatou, 180 m, 17 May 1995, *G. Cremers & J.J. de Granville 13979* (CAY). GUYANA: Orinduik Falls, Ireng River, 2000 ft, 6 Aug 1958, *S.G. Harrison 1386* (K); Pakaraima Mountains, upper Ireng River, Orinduik Falls, 04°43'N, 60°01'20"W, 700 m, 28 Jul 1994, *T.W. Henkel & M. Chin 5847* (US); Shea Rock, 200 m, 26 Aug 1995, *M.J. Jansen-Jacobs et al. 4860* (U, US).

76. Rhynchospora triflora Vahl, Enum. Pl. 2: 232. 1805. *Scirpus triflorus* (Vahl) Poir. in Lamarck, Encycl. Suppl. 2: 249. 1811. *Ephippiorhynchium triflorum* (Vahl) Nees in Martius, Fl Bras. 2(1): 136. 1842. *Dichromena triflora* (Vahl) J. F. Macbr., Publ. Field Mus. Nat. Hist. Bot. Ser. 11: 6.1931. TYPE: India; "Habitat in India orientali," (holotype: C-Vahl, microfiche US ex C). Figs. 49, 56C-D.

Cephaloschoenus ceylanicus Nees, Edinburgh New Philos. J. 17: 265. 1834. *Rhynchospora ceylanica* (Nees) Kunth, Enum. Pl. 2: 294. 1837. *Calyptrostylis ceylanica* (Nees) Nees, J. Bot. (Hooker) 2: 394. 1840. TYPE: Asia; Ceylon (Sri Lanka), *Macrae s.n.* (holotype: K).

Rhynchospora stenorrhyncha Griseb., Fl. Brit. W. I. 575. 1864. TYPE: Trinidad, *Purdie s.n.* (holotype: BM).

Rhynchospora karuaiana Steyerm., Fieldiana, Bot. 28 (1): 43. f. 5L. 1951. TYPE: Venezuela; Bolivar, Río Karuai, *Steyermark 60334* (holotype: F).

Rhizomatous perennial, 58-170 cm tall; rhizome stout, 3-6 mm thick, horizontally creeping, the culms spaced close together along rhizome; roots coarse, 2-4 mm thick, spongy, easily compressed with internal chambers, brown to yellowish brown, the surface glossy; sheathing base of culm 6-15 mm wide. Culms sharply ascending to erect, (1-) 1.5-4 (-4.5) mm wide, trigonous to subtriquetrous distally with antrorsely scabrous angles towards apex, trigonous to obtusely trigonous with smooth angles proximally, firm, finely and closely ribbed, channeled along one side distally, green, glabrous. Leaves 5-8, basal and cauline, 20-73 cm long; sheaths eligulate, to 25 cm long on basal leaves, spongy-thickened proximally, finely veined with cross partitions between the veins, pale brown to brown, glabrous, margins smooth to antrorsely scabrous (at least on distal sheaths), the inner band of basal sheaths membranous, splitting with age, that of cauline sheaths herbaceous except for the convex, herbaceous, scarious-tipped contraligule with anasmotising veins; blades linear, 2.2-11 (-13) mm wide (unfolded), folded and spongy-thickened proximally, often flattened-plicate to subplicate distally, veins cross-partitioned on spongy portion proximally, distinctly finely veined abaxially, smoother and often with indistinct veins adaxially, green both sides, antrorsely scabrous on margins and abaxial midvein, attenuate to triquetrous apex. Inflorescence a terminal and 1 or 2 lateral, open, compound, corymbose partial panicles, each subtended by a single leaf-like bract, the terminal panicle 8-32 × 2-10 cm; bracts elongate, reduced distally; peduncles of lateral panicles and pancle branches slender, trigonous to compressed-trigonous, 0.3-0.6 mm wide, antrorsely scabrous on angles; primary rays up to 25 cm long, the spikelets in hemispherical to narrowly hemispherical clusters or fascicles at ray tips, each fascicle bearing 2-12 spikelets; spikelets elliptic-lanceolate, 6-9 × 1.7-2.6 mm, cuneate at base, acuminate to apex, appearing somewhat laterally compressed when fruiting; scales dorsally obtuse, or rounded on immature spikelets, thinly herbaceous to submembranous, subglossy, finely cellular-striate, uniformly brown, often tinged with red, with broad yellow-brown membranous margins, the distal staminate scales of spikelet often membranous, midcosta wire-like, light brown, prolonged beyond the obtuse to acute apex as a short, scabrous, upturned, short awn; fertile scales 3-7, widely ovate-elliptic, 5.4-7.5 × 3-4 mm, deeply cuculate, the lowermost one bisexual, the uppermost 2-6 staminate only, linear, ca. 1 mm wide, membranous; sterile scales 3 or 4, broadly ovate, subrounded, or ovate-elliptic, 1-5 × 1-3.2

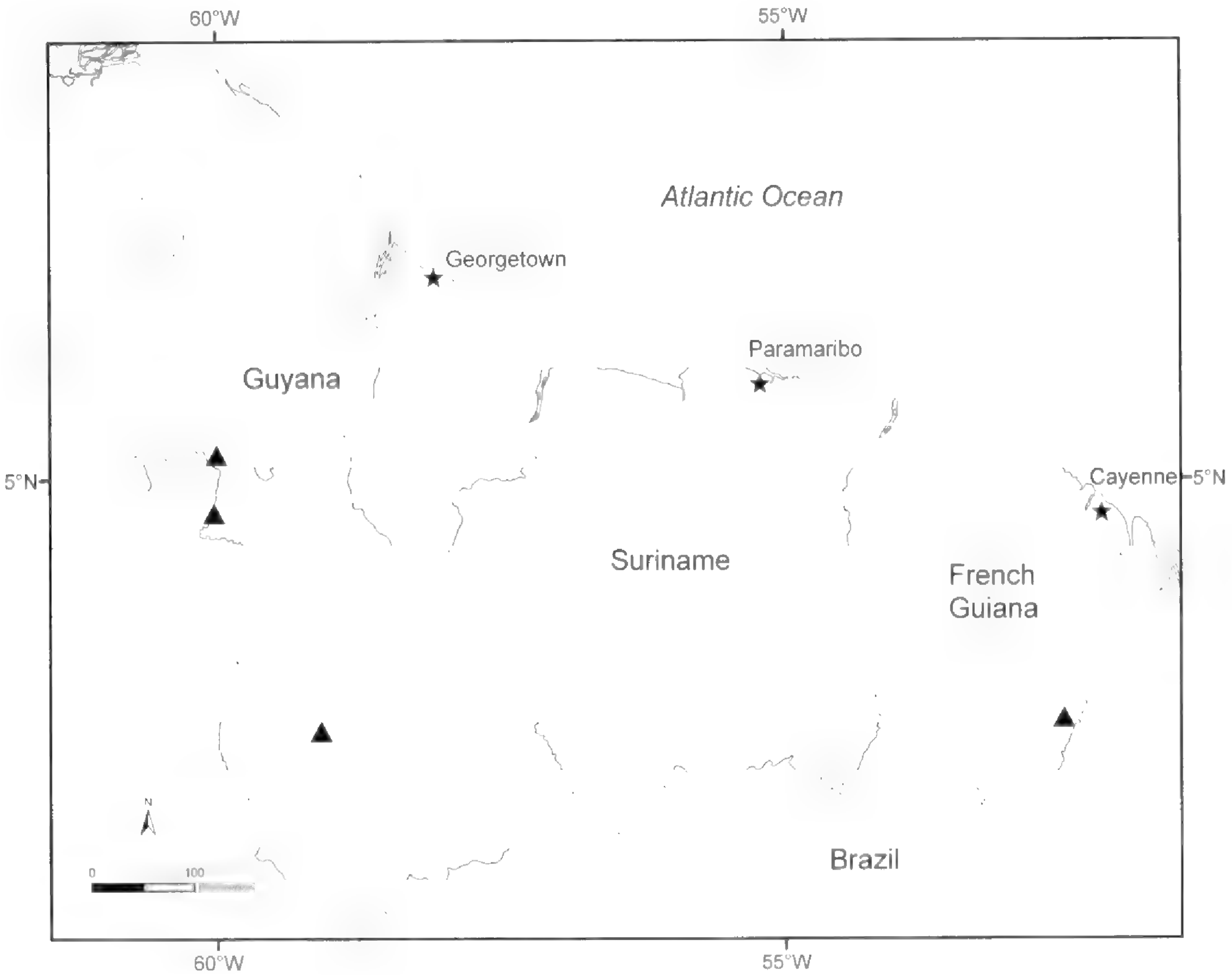

Fig. 48. Distribution of *Rhynchospora trichochaeta* in the Guianas.

mm. Stamens 3, the anthers filiform, 3-3.5 mm long, with a linear-triangular appendage at apex, truncate and minutely papillate at base; style entire (unbranched), long-exserted from scales, glabrous, blackened. Achene biconvex, one side essentially plane, obovate, 3-4.1 × 1.7-2.3 mm, rounded at apex, often with sharp prickles on shoulders, evenly tapered to base, distinctly transversely rugulose with sharply acute ridges, subglossy, margins smooth only along edge, uniformly brown; epidermal cells linear, vertically oriented; style base subulate-lanceolate, 4-6.3 mm long, 0.4-0.7 mm wide at base, laterally compressed, firm, pale brown, unequally 4-angled (rectangular in cross section), often sparsely antrorsely scabrous on angles, the two wider faces overlapping achene apex on each side, these (overlapping portions) unlobed, with spreading barbs along margins, the tip of style base exserted beyond apex of subtending scale; bristles 6, linear-subulate to subulate, antrorsely spinulose with reddish barbs, exceeding apex of achene body.

Distribution: Mexico (Campeche), Central America (Guatemala, Honduras, Nicaragua, Costa Rica, and Panama), Greater Antilles (Cuba and Hispaniola), Trinidad, South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, Bolivia, and Paraguay), Africa, and Old World tropics (Sri Lanka, Indo-China, and Malesia), and New Guinea.

Habitat in the Guianas: In water of lowland swamps, stream banks, marshy areas, and savanna, 0-80 m.

Distinguishing features: *Rhynchospora triflora* is similar in habit to *R. trispicata.* However, the achenes of these two species are very different. Those of *R. triflora* are obovate and have a surface that is distinctly transversely rugulose with sharply acute ridges, while those of *R. trispicata* are elliptic-oblanceolate and have a surface that is

punctate or indistinctly rugulose medially at maturity.

Specimens examined: FRENCH GUIANA: Cayenne, 1859, *P. Sagot s.n.* (BM); Savane de Corossony, sur la piste de St. Elie, 4 à 7 km à l'WSW de Sinnamary, 19 Jan 1978, *A. Raynal-Roques 19868* (CAY); near Crique Gabrielle, tributary right bank lower Mahury River, 04°43'N, 52°17'W, 16 Feb 1978, *A.J.M. Leeuwenberg 11811* (CAY); Savane Fusées Sondes, 05°12'48"N, 52°44'00"W, 20 Feb 1995, *L. Cadamuro & Solacroup 282* (CAY). GUYANA: SE of Georgetown, East Coast Water Conservancy, canal SE of Lamaha Stop-off, 27 Nov 1919, *A.S. Hitchcock 17010* (US); Mahaicony-Abary rice area, ca. 35 mi. SE of Georgetown, <10 ft, 15 Oct 1955, *E.L. Little Jr. 16872* (US); about 35 mi. SE of Georgetown, <3 m, 18 Oct 1955, *E.L. Little Jr. 16900* (US); Rupununi Northern Savanna, Pirara head waters, 03°40'N, 59°30'W, ca. 80 m, 22 Oct 1996, *C.N. Horn & J. Wiersema 11051* (US). SURINAME: Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp, Veen bij km 12.1, 11 Oct 1948, *J. Lanjouw & J.C. Lindeman 764* (U); Via secta ab Moengo Tapoe ad Grote Zwiebelzwamp, Begin grote zwamp bij 17.3, 21 Oct 1948, *J. Lanjouw & J.C. Lindeman 936* (K, U); nabij Zeekoe Kreek, Coesewijne Rivier, district Saramacca, 30 Mar 1976 *P.A. Teunissen LBB15500* (U); W.v. de Goede Hoop, Coppename Rivier, 7 May 1976, *P.A. Teunissen LBB15502* (U); nabij Zeekoe Kreek, Coesewijne Rivier, bovenloop, 30 Mar 1976, *P.A. Teunissen 15500* (U); W.v. de Goede Hoop, Coppename Rivier, 7 May 1976, *P.A. Teunissen 15502* (U).

77. Rhynchospora trispicata (Nees) Schrad. ex Steud., Syn. Pl. Glumac. 2: 145. 1855. *Ephippiorhynchium trispicatum* Nees in Martius, Fl. Bras. 2(1):136. 1842. TYPE: Brazil; "In campestribus udis provinc. Pihay," *Martius 3232* (holotype: M). Figs. 50, 57C-D.

Rhynchospora guianensis Lindeman & Dons., Acta Bot. Néerl. 20 (4): 440. 1971. TYPE: Suriname; Sipaliwini Savanna, *Oldenburger & Norde 133* (holotype: U!).

Coarse rhizomatous perennial, 38-180 (-240) cm tall; rhizome short, thickened, hard; roots coarse, to 1 mm thick, spongy, easily compressed with internal chambers, yellowish brown to brown, the surface glossy; sheathing base of culm stout, 1-4 cm wide. Culms trigonous or obtusely so proximally, often triquetrous distally, 2-11 mm wide, firm, finely ribbed and channeled, often scabrous-tuberculate on angles (at least distally), channeled along one side distally, green, glabrous. Leaves 5-8, basal and cauline, 28-80 cm long; sheaths eligulate, to 25 cm long on basal leaves, spongy-thickened proximally, finely veined with cross partitions between veins, green to pale brown, glabrous, margins smooth to antrorsely scabrous (at least on distal sheaths), the inner band of basal sheaths membranous, splitting with age, that of cauline sheaths herbaceous except for the convex, herbaceous, scarious-tipped contraligule with anasmotising veins; blades linear, (1-) 3-14 mm wide (unfolded), folded and spongy-thickened proximally, often flattened-plicate to subplicate distally, veins with cross partitions on spongy portion proximally, distinctly finely veined abaxially, smoother and often with indistinct veins adaxially, green both sides, antrorsely scabrous on margins and abaxial midvein, attenuate to triquetrous apex. Inflorescence a terminal and 1 or 2 lateral, open, compound, corymbose partial panicles, each subtended by a single leaf-like bract, the terminal panicle very open and diffuse, 10-70 × 5-28 cm; bracts elongate, reduced distally; peduncles of lateral panicles and pancle branches slender, trigonous to compressed-trigonous, or subcrescentiform, 0.3-0.6 mm wide, antrorsely scabrous on angles; primary rays up to 30 cm long, the spikelets borne on a short rachis, arranged in hemispherical to narrowly hemispherical clusters or fascicles at ray tips, each fascicle bearing 3-20 spikelets each; spikelets narrowly elliptic-lanceolate, (7.5-) 8-10 (-11) × 1.3-2 mm, obtuse at base, acuminate to apex, appearing dorsally compressed when fruiting; scales dorsally rounded to broadly rounded, submembranous with scarious margins, subglossy, finely cellular-striate, uniformly light brown to brown, tinged with red, midcosta wire-like, light brown, prolonged beyond the acute apex as a scabrous, slightly recurved mucro; fertile scales 1-3, elliptic-lanceolate to ovate-lanceolate, 7.9-9.8 × 2.7-3.8 mm; sterile scales 3, ovate to oblong-ovate, 2-7 (-7.5) × 1-2.7 mm. Stamens 3, the anthers filiform, 3.2-5.1 mm long, apiculate and often beset with crystalline prickles at apex, narrowed to base with minute papillae; style entire (unbranched), long-exserted from scales, glabrous, blackened. Achene bisulcate,

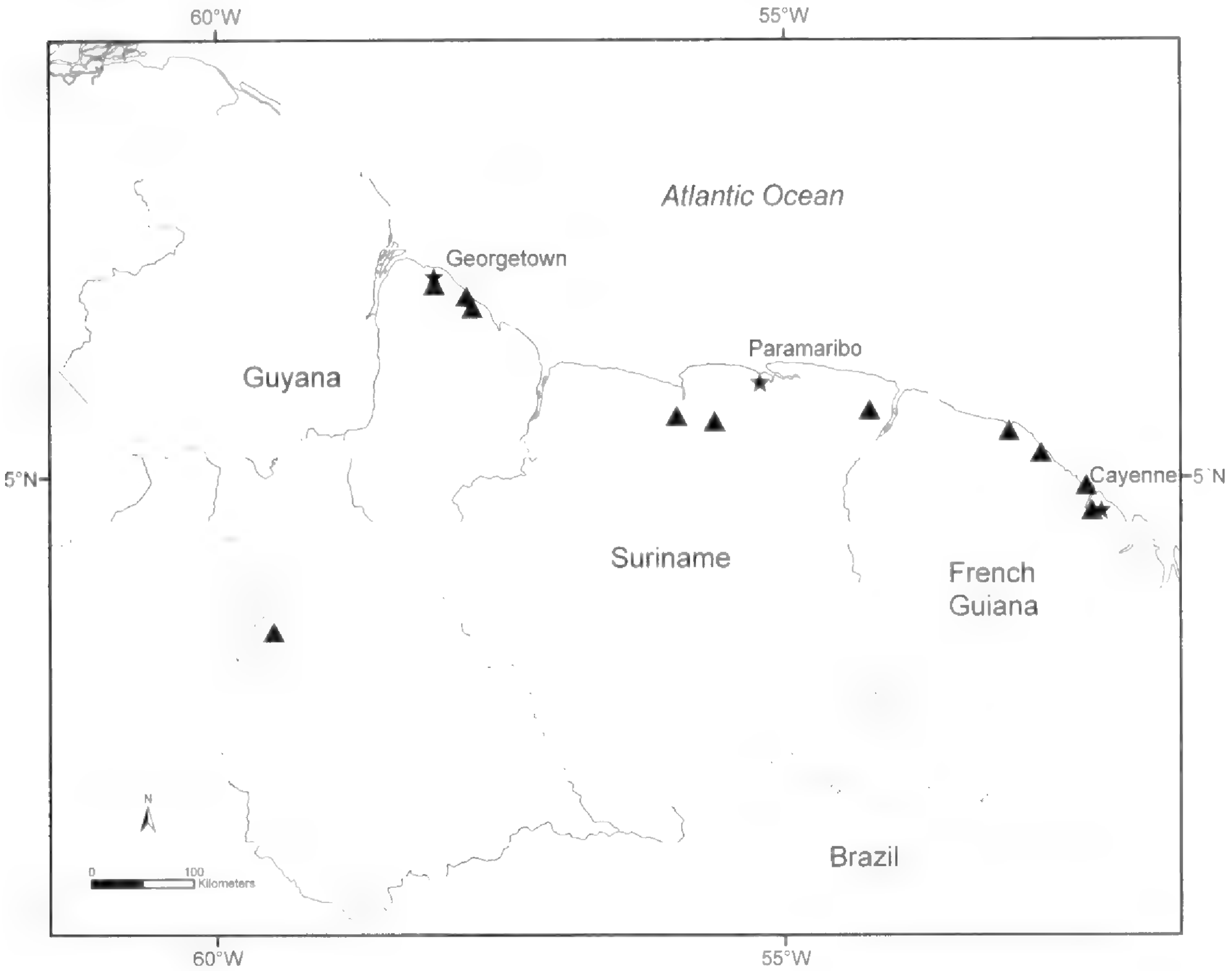

Fig. 49. Distribution of *Rhynchospora triflora* in the Guianas.

elliptic-oblanceolate, 4.9-6 × 1.3-1.8 (-1.9) mm, obtuse to rounded at apex, acuminate to base, with concave or sulcate faces, puncticulate, or at maturity, finely transversely rugulose, the papillae not evident, glossy, with broad smoothish margins, brown; epidermal cells isodiametric, central nodules poorly developed or not evident; style base linear-lanceolate or subulate distally, 3.7-7.3 mm long, 0.4-0.7 mm wide at base, laterally compressed, firm, pale brown, 4-angled (rectangular in cross section), often sparsely antrorsely scabrous on angles, the two wider faces overlapping achene apex on each side, these (overlapping portions) 2-lobed, the lobes with spreading barbs along margins, the tip of style base exserted beyond apex of subtending scale; bristles 6, linear-subulate to subulate, antrorsely spinulose with reddish barbs, exceeding apex of achene body.

Distribution: Southern Mexico, Central America (Honduras, Nicaragua, and Costa Rica), Greater Antilles (Cuba), and South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, Bolivia, and Paraguay).

Habitat in the Guianas: In moist to wet soils; marshy areas, sand savanna, sandy clay savanna overlain with lateritic gravels, muddy pond shores, stream margins, secondary forest, edges of forests, trails, roadsides, cut-over forests and other early successional habitats, and disturbed areas, 0-340 m.

Distinguishing features: See discussion under *R. triflora*.

Specimens examined: FRENCH GUIANA: Exploitation Matéo, Route de Mana, PK 12, without date, *A. Leclerc 298* (CAY); Loiusines de Kourou, transect no. 7, 22 Jun 1962, *J.J. Hoock s.n.* (U); Saint Laurent du Maroni, 6 km S on road from Mana to Saut Sabbat, 21 Mar 1976, *A. Raynal-Roques 18760* (P, U, US); Basse Mana près de Saut, Sabbat "Petit Laussat", 16 Jun 1976, *J.J.*

de Granville B5331 (U); Basse Mana près de Saut Sabbat "Petit Laussat", 16 Jun 1976, *J.J. de Granville 5331* (CAY); Piste de St. Elie (rte en construction longue de 22 km, partant du km 4 de la rt. Sinnamary-Iracoubo), 22 Dec 1977, *A. Raynal-Roques 19704* (CAY); Pripris Maillard, grand marais à 4 km au SE de Tonate, 19 Feb 1978, *A. Raynal-Roques 20078* (CAY); Bord du bout de la piste St Elie, km 22, 15 Nov 1978, *M.F. Prevost 386* (CAY, U); Bord de la piste de St. Elie, km 16.3, 20 Mar 1979, *M.F. Prevost 459* (CAY); Route de Cayenne à St Laurent, PK 185, 10 km après l'embranchement de Mana au Sud près d'un saut, 8 Oct 1979, *G. Cremers 5950* (CAY, U); Sinnamary, piste de St Elie, 22 Oct 1981 *F. Billiet & B. Jadin 1106* (CAY, U); Piste de St. Elie, SW Sinnamary, Abattis I, en touffe, 11 Feb 1982, *D.Y. Alexandre 21* (CAY); Along St. Elie track, NW of Sinnamary, along trail beyond km marker 23, W of ORSTOM "Ecerex" project, 200-250 m, 05°30'N, 48°00'W, 6 Jul 1982, *T.B. Croat 53833* (CAY, MO); Route de Cayenne à Kourou, PK 35 environ au bord de la route, 13 Aug 1982, *A. Fournet 259* (CAY); Piste de Paul Isnard, 10 km SE of St. Laurent, 05°25'N, 54°00'W, 5-15 m, 17 Nov 1986, *L.E. Skog et al. 7441* (F, MO, US); Piste de St. Elie, CD-21, km 15.7, 05°25'N, 53°10'W, 100 m, 15 Sep 1987, *W. Hahn 3724* (CAY, NY, U, US); Route de Belizon, R.N. 2, 1 Jun 1988, *G. Cremers 10039* (CAY, US); Dégrad Saramaca, Bassin du Kourou, SSW Kourou, 20 m, 9 Jun 1989, *G. Cremers & M. Hoff 10657* (CAY, G, NY, P, U, US); Piste de Kaw, km 34, 340 m, 04°33'N, 52°09'E, 23 Nov 1989, *F. Billiet & B. Jadin 4599* (CAY); Station ECEREX, Piste de Saint-Elie, bassin versant C, 05°20'N, 53°00'W, 30 Oct 1989, *M. Hoff 5763* (CAY); Domaine de Prèfontaine, Région de Cayenne, 10 m, 04°59'N, 52°28'W, 6 Dec 1989, *M. Hoff 6120* (CAY); Piste de Saint-Elie, 27 Apr 1994, *S. Albertini 43* (CAY); Placer Boulanger, Bassin de la Comté, 04°34'N, 52°25'W, Jul 1997, *G. Andrieux & M. Rousset 70* (CAY). GUYANA: About 35 mi. SE of Georgetown, Helicopter stop 19, <3 m, 15 Oct 1955, *E.L. Little Jr. 16872* (US); Vicinity of Karanambo, 03°45'N, 59°20'W, 26 Sep 1988, *P.J.M. Maas et al. 7695* (U); Rupununi Southern Savanna, Cayman Pond and other ponds up to several km north and east of Dadanawa, 02°50'N, 59°25'W, 110-120 m, 19 Aug 1995, *C.N. Horn et al. 10089* (US); Rupununi Northern Savanna, Pirara head waters, NW of Yupukary, 03°40'N, 59°30'W, 80 m, 22 Oct 1996, *C.N. Horn & J. Wiersema 11035* (US). SURINAME: Sipaliwini Savanne area on Brazilian frontier, in valley N of Viergebroeders hills, 18 Sep 1968, *F.H.F. Oldenburger et al. 133* (U); Without locality, 6 Nov 1976, *P.A. Teunissen 16052* (U).

78. Rhynchospora tuerckheimii C. B. Clarke ex Kük., Bot. Jahrb. Syst. 74: 402-403. 1949. TYPE: Guatemala; Dept. Alta Verapaz, *Türckheim 1258* (holotype: K; isotype: US!). Figs. 51, 64C-D.

Rhizomatous perennial, (50-) 94-210 cm tall; rhizome short, knotty, sometimes ascending; roots coarse to medium; sheathing base of culm 3-5 mm wide. Culms ascending, 1.4-3.3 mm wide, obtusely trigonous to trigonous distally, stiff and hardened, finely and closely ribbed, channeled along one side distally, tan proximally, green distally, thinly pilose-puberulent to glabrous proximally. Leaves ascending to spreading, numerous, primarily cauline, internodes short mid-culm and distally (leaves closely spaced), 18-35 cm long, the lower cauline blades shorter than the mid to upper cauline ones; sheaths somewhat loose, short mid-culm, elongate proximally, herbaceous, finely and closely veined, green distally, tan proximally, thinly pilose-puberulent or densely so on inner band, inner band narrowly membranous on basal sheaths, herbaceous and membranous only at orifice on distal sheaths, often reddish brown and cross-puckered, the orifice convex, contraligule-like, minutely black-dotted; ligule a thin line or band of tissue at adaxial junction of sheath and blade; blades narrowly linear, 1.7-5.7 (-6.5) mm wide, subflattened-plicate, herbaceous, green both sides, adaxial midvein pilose, abaxial surface sparsely pilose to glabrous, adaxially smooth, antrorsely scabrous on margins and abaxial midvein, attenuate to triquetrous apex. Inflorescence a series of 3-7, open to subcontracted, partial pyramidal panicles from the upper leaf-like bracts; terminal panicle largest, 3-7 × 2.3-5 cm, with 30-70 spikelets, the lower successively smaller; inflorescence branches sharply angled, the angles pilose; spikelets narrowly ovoid-ellipsoid, (4-) 4.5-7.5 (-8) × 1.3-2.2 mm, acuminate at apex, cuneate at base; scales dorsally rounded to broadly rounded, herbaceous (proximal scales), submembranous (distal scales), dull, uniformly stramineous to pale brown, glabrous, margins narrowly scarious, distal scales inrolled, midcosta inconspicuous, wire-like, pale

brown, prolonged as a mucro beyond the acute to narrowly acute or obtuse apex; fertile scales 5-7, ovate-elliptic to widely ovate-lanceolate, 3-7 × 2-3.2 mm; sterile scales 4, ovate to ovate-elliptic, 1.2-4 × 0.8-2.7 mm. Stamens 2, the anthers 1.5-2.6 mm long, subulate-apiculate at apex, truncate with minute papillae at base; style entire, exserted beyond subtending scale. Achenes biconvex, quadrate-obovate, 1.1-1.6 × 0.8-1.2 mm, obtuse to subtruncate at apex, broadly attenuate at base, cancellate with 14-18 vertical rows of horizontally oriented rectangular cells, pale brown to light brown; epidermal cells rectangular, horizontally oriented; style base lanceolate, sagittate (2-lobed) at base, 1-2.3 mm long, 0.5-0.8 wide at base, thin, brittle, pale brown, dotted or flecked with brown; bristles 1-3, several often rudimentary, shorter than to equaling apex of achene body, antrorsely barbed, reddish.

Distribution: Mexico, Central America (Costa Rica, Guatemala, Honduras, Nicaragua, and Panama) and South America (Venezuela, Guyana).

Habitat in the Guianas: Densely forested slopes of Mt. Ayanganna and Mt. Maringma, Pakaraima Mountains, 1100-1490 m.

Distinguishing features: Similar in habit, scale color, and spikelet morphology to *Rhynchospora polyphylla* but differs from it in having generally 2 vs. 3 stamens, larger achenes (1.1-1.6 × 0.8-1.2 mm vs. 0.8-1.2 × 0.6-0.8 mm) with 14-18 vertical rows of horizontally oriented rectangular cells vs. 7-10 vertical rows of cells, and a lanceolate style base (1-2.3 mm long) vs. a triangular one (0.4-1 mm long) in *R. polyphylla.*

Specimens examined: GUYANA: Pakaraima Mountains, toe slopes on NW side of Mt Ayanganna, 05°24'N, 59°57'W, 1100-1200 m, 7 Nov 1992, *B. Hoffman & T. Henkel 3275* (NY, U,

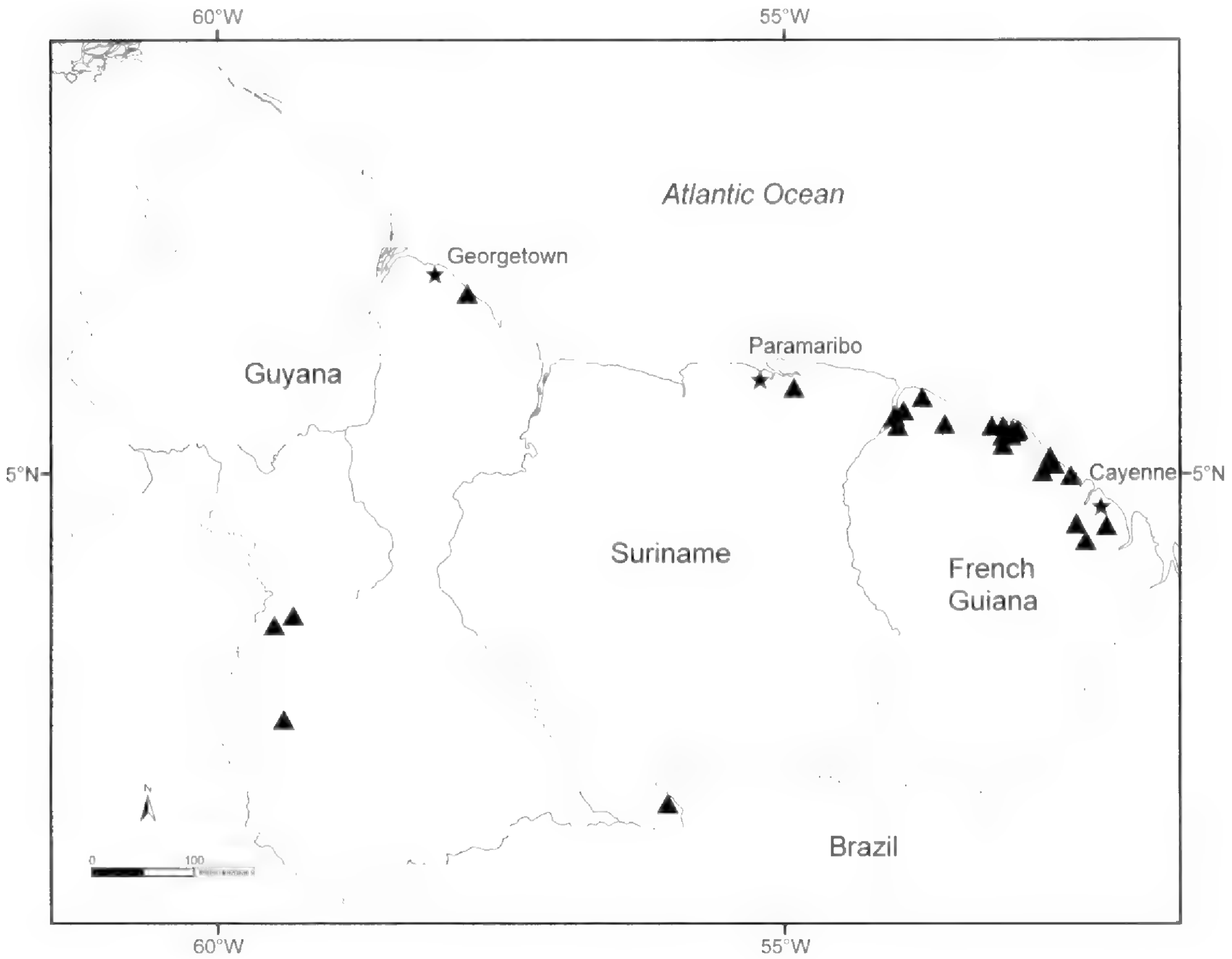

Fig. 50. Distribution of *Rhynchospora trispicata* in the Guianas.

US); Mt. Maringma, southern slopes of summit escarpment, Arabaru River, 05°12'16.6"N, 60°34'35.9"W, 1360 m, 11 June 2004, *H.D. Clarke et al. 11578* (US); Mt. Maringma, base of summit escarpment, Arabaru River, 05°12'9.9"N, 60°34'55.7"W, 1370 m, 12 June 2004, *H.D. Clarke et al. 11588* (US); Mt. Maringma, slope below subsummit plateau, 05°12'16.6"N, 60°34'35.9"W, 1490 m, 22 June 2004, *H.D. Clarke et al. 11945* (US).

79. Rhynchospora velutina (Kunth) Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøebenhavn 1869: 149. 1869. *Dichromena velutina* Kunth, Enum. Pl. 2: 282. 1837. *Psilocarya velutina* (Kunth) Nees in Martius, Fl. Bras. 2(1): 115. 1842. TYPE: Brazil; "Brasilia meridionalis," *Sellow s.n.* (holotype: B, destroyed). Figs. 51, 80A-B.

[*Schoenus velutinus* Schrad. ex Kunth, Enum. Pl. 2: 282. 1837, *nom. in syn.*].

Dichromena sellowiana Kunth, Enum. Pl. 2: 282. 1837. *Psilocarya sellowiana* (Kunth) Nees in Martius, Fl. Bras. 2(1): 117. 1842. *Rhynchospora velutina* var. *sellowiana* (Kunth) Boeck. ex Kük., Bot. Jahrb. Syst. 75: 173. 1950. *Rhynchospora kuekenthalii* Herter, Rev. Sudamer. Bot. 9(5): 158. 1953, *nom. nov.*, non *Rhynchospora sellowiana* Steud., 1840. TYPE: Brazil; "Brasilia meridionalis," *Sellow s.n.* (holotype: B, destroyed).

[*Schoenus mollis* Schrad. ex Nees in Martius, Fl. Bras. 2(1): 115. 1842, *nom. in syn.*].

[*Pachymitra velutina* (Kunth) Nees in Martius, Fl. Bras. 2(1): 115. 1842, *nom. in syn.*].

Psilocarya rufa Nees in Martius, Fl. Bras. 2(1): 117. 1842; *Rhynchospora rufa* (Nees) Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1869: 149. 1869. LECTOTYPE: Guyana, *Schomburgk 667* (US, isolectotype: BM-2, G-2, K-2), designated by M. T. Strong & P. Acevedo-Rodríguez, Contr. U. S. Natl. Herb. 52: 362. 2005.

Psilocarya pohlii Nees in Martius, Fl. Bras. 2(1): 115. 1842. *Rhynchospora velutina* var. *pohlii* (Nees) Boeck. ex Kük., Bot. Jahrb. Syst. 75: 173. 1950. SYNTYPES: Brazil. Goiaz, Serra dos Cristaes et montibus Claris, *Pohl 73 & 1179* (W).

Psilocarya divergens Nees in Martius, Fl. Bras. 2(1): 116. 1842. *Rhynchospora velutina* var. *divergens* (Nees) Boeck. ex Kük., Bot. Jahrb. Syst. 75: 173. 1950. TYPE: Brazil; Minas Gerais, "deserto fluminis S. Francisci prov. Minarum", *Martius 3441* (holotype: M, photo US ex M).

Psilocarya mexicana Liebm., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 2: 248. 1851. *Rhynchospora velutina* var. *glabrescens* Boeck., Bot. Jahrb. Syst. 1: 364. 1881, *nom. nud.* TYPE: Mexico; Veracruz, between La Isleta and Malvapam, *Liebmann s.n.* (holotype: C).

Rhynchospora mexicana C. Wright ex Sauvalle, Fl. Cub. 182. 1871, non Steudel, 1855. *Rhynchospora rufa* var. *liebmanniana* C. B. Clarke in Urban, Symb. Antill. 2: 117. 1900, *nom. & stat. nov.* TYPE: Cuba, *C. Wright 2683* (holotype: probably at HABA or HAC; isotypes: K, NY).

[*Pachymitra rufa* (Nees) Nees ex Boeck., Linnaea 37: 616. 1873, *nom. in syn.*].

Psilocarya pauloensis Boeck., Beitr. Cyper., Heft. 2: 24. 1890. TYPE: Brazil; São Paulo. Itapetininga, *Loefgren 143* [in part] (holotype: S; isotype: C, photo US ex C).

[*Rhynchospora auraeformis* C. B. Clarke, Illustr. Cyp. t. 71, f. 3. 1909, *nom. nud.*].

Rhizomatous perennial, 66-174 cm tall; rhizome short, stout and thickened, hardened; roots coarse, 1-2 mm thick; sheathing base of culm 5-18 mm wide. Culm erect to ascending, 1-4.6 mm wide, widest at base, often rooting at several nodes just above base, trigonous with blunt angles to obtusely trigonous, firm, not hardened, finely ribbed, channeled on one side distally, essentially smooth, green, often with pale green ribs, glabrous or with a few trichomes proximally. Leaves ascending, 6-11, basal and cauline, leaves at very base often with very short blades or blades absent, 10-90 cm long; sheaths eligulate, medium length, soft, herbaceous, closely and finely veined with pale green veins, light green or pale brown proximally, green distally, hirsute to glabrescent, inner band membranous on basal sheaths, membranous only at orifice on cauline sheaths, the orifice concave, U-shaped on cauline sheaths; blades narrowly linear, 1.5-5 (-6) mm wide, flattened to plicate, herbaceous, finely veined, green and pilose to glabrescent abaxially, sometimes pilose proximally, the adaxial surface rugose or warty to somewhat smooth or roughened, glossy, green to whitish, finely cellular-reticulate

with white crystals evident in some cells, glabrous, margins smooth to scabrous distally, long-attenuate to triquetrous apex. Inflorescence a terminal and series or 1-3 (-4) lateral, lax, corymbose partial panicles from the upper leaf-like bracts, reduced in size proximally; bracts typically shorter and narrower than leaves, these and panicle bractlets often long-ciliate on margins; terminal panicle 2.5-15 × 2-11 cm, with 17-190 spikelets, central axis triquetrous, long-ciliate on angles; branches and rays compressed-trigonous to subterete, finely ribbed, green, glabrous; spikelets ovoid-ellipsoid, acute to acuminate at apex, acute to obtuse at base, 5.5-7 (-9) × (1.3-) 1.5-2.5 mm, the scales slightly spreading with maturing achenes; scales 12-23 per spikelet, obtuse to subrounded dorsally, thinly herbaceous to submembranous, finely cellular-striate, uniformly reddish or yellowish brown, ofteh with dark brown lineations medially on sides, glabrous, margins widely scarious, entire, slightly undulate, midcosta very fine, inconspicuous, often setose at apex, extending beyond the acute apex as a short slightly recurved awn, the apex of distal spikelet scales often recurved; fertile scales 9-18, widely ovate or widely ovate-deltate to widely ovate-lanceolate or ovate-lanceolate, 3.2-6.2 × 1.4-3.5 mm, apical spikelet scales lanceolate; sterile scales 3-5, ovate to very widely ovate-deltate, 1.4-3.5 × 1-2.7 (-3) mm. Stamens 3, the anthers 2-3.5 mm long, with an elongate papillate appendage at apex, truncate at base with minute lobes or papillae; style 2-branched, as long as unbranched portion or extending nearly to base, well-exserted beyond apex of subtending scale. Achene biconvex, at maturity often falcate in longitudinal section, obovate or obovate-deltate, 1.5-1.7 × 1.3-1.6 mm, truncate at apex, cuneate at base, transversely rugulose-papillate, with cellular-reticulate-papillate margins, brown, yellowish brown, or dark brown; epidermal cells rectangular to linear, vertically oriented; style base triangular to triangular-lanceolate, 0.8-1.2 × 1.2-1.4 mm (nearly as wide as achene at base), 2-lobed at base, the lobes overlapping apex of achene, brittle, crustose, pale brown to light brown; bristles absent.

Distribution: Southern Mexico, Central America (Guatemala, Honduras, and Nicaragua), Greater Antilles (Cuba, Hispaniola, and Puerto Rico), and South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil, Bolivia, Paraguay, and Argentina).

Habitat in the Guianas: Sand savanna and sandy clay savanna, forest edges, rocky forests, creek banks, marshy areas, and pond margins, 200-1100 m.

Specimens examined: FRENCH GUIANA: Savane de Corossony, sur la piste de St. Elie, 4 à 7 km à l'WSW de Sinnamary, 19 Jan 1978, *A. Raynal-Roques 19867* (CAY); Savane Onemark, Ile de Cayenne, 18 May 1990, *G. Cremers & M. Hoff 11416* (US); Savane Onemark, Ile de Cayenne, 18 May 1990, *G. Cremers & M. Hoff 11466* (B, CAY, NY, P, U, US). GUYANA: Without locality or date, *Mr. Parker s.n.* (K); Without locality, 1839, *R. Schomburgk 667* (BM, G, K, U, US); Without locality, Apr 1889, *G.S. Jenman 6129* (K, US); Demerara River, Jun 1889, *G.S. Jenman 6126* (K, U); Lama Savanna, Apr 1889, *G.S. Jenman 6130* (K, NY, US); Rupununi-savannen, Feb & Mar 1952, *Ir J.G.P. Dirven LP209* (U); Ebini Experimental Station, Berbice River, 20 Jun 1958, *S.G. Harrison 1173* (K); South Rupununi savanna, Komirwana Tau area, 4 km SE of Aishalton, 02°30'N, 59°15'W, 250 m, 22 May 1994, *T.W. Henkel & R. James 3851b* (GENT,MO, US); Pakaraima Mountains, Upper Ireng River watershed, Malakwalai-Tipu, 300 m downslope from NE escarpment, 04°48'N, 60°18'W, 1100 m, 17 Jul 1994, *T.W. Henkel et al. 5674* (US); Bushmouth Shea to Quitaro River, Bowl Creek, 200 m, 02°54'N, 59°07'W, 29 Aug 1995, *M.J. Jansen-Jacobs et al. 4929* (U). SURINAME: Upper Sipaliwini Rivier, camp VIII, 17 Nov 1935, *H.E. Rombouts 295* (U); Upper Sipaliwini Rivier, camp B, 20 Jan 1936, *H.E. Rombouts 395a* (BM, C, K, MO, U); Zanderij-complex, 31 Jul 1952, *Ir J.G.P. Dirven LP314* (U); Zanderij-complex, 31 Jul 1952, *Ir J.G.P. Dirven LP319* (U); Sipaliwini Savanne, 30 Aug 1968, *F.H.F. Oldenburger & R. Norde 23* (U); near S-camp II, southern Sipaliwini Savanne on the Brazilian frontier, 285 m, 25 Jan 1970, *F.H.F. Oldenburger et al. 1046* (U); Sipaliwini Savanne (southern) on the Brazilian frontier, NE of S-camp I, 285 m, 29 Jan 1970, *F.H.F. Oldenburger et al. 1070* (U); Tibiti Savanne, 20 May 1976, *P.A. Teunissen 15501* (U).

80. Rhynchospora watsonii (Britton) Davidse, Ann. Missouri Bot. Gard. 61: 529. 1974. *Dichromena watsonii* Britton, Bull. Torrey Bot. Club 15: 101. 1888. [as '*watsoni*']. *Rhynchospora radicans* var. *watsonii* (Britton) Kük., Bot. Jahrb. Syst. 75: 311. 1951. TYPE: Guatamala, *S. Watson 153* (holotype: NY!).

Figs. 51, 76C-D.

Dichromena fasciata Maury, J. Bot. (Morot) 2: 396. 1888. TYPE: Colombia; Armada, *André* 3389 (holotype: K, photo at US).

Rhynchospora dussiana Boeck., Beitr. Cyper., Heft 2: 40. 1890. *Rhynchospora dussii* Boeck. ex Duss, Annal. Colon. Inst. Marselle 3: 553. 1896 [orthographic variant]. TYPE: Martinique; "au pieds des Pitons du Carbel," *Duss 462* (holotype: B, destroyed; isotype: NY).

Caespitose short-lived perennial, 15-120 cm tall; rhizome short; roots medium to fine. Culms erect to sometimes arching, 0.8-2 mm wide, firm, green, obscurely 4- to 6-sided, often sulcate on the sides and narrowly winged on the angles, 6-ribbed, the ribs often forming the angles, smooth to antrorsely scabrous; sheathing base of culm 2.5-5 (-6) mm wide. Leaves primarily cauline, (3-) 4-8, those at or near base with shortened blades, 2-65 cm long; sheaths loose, gradually becoming inflated distally, finely veined with sparse cross partitions between veins, green, with herbaceous inner band, the orifice deeply U-shaped, ciliate along margin; blades linear-lanceolate, (4-) 5-12 (-14) mm wide, green, with 7-9 pale green fine but distinct costae, glabrous adaxially, glabrous to sparsely pubescent and minutely whitish punctate abaxially, often ciliate basally along margins, margins (at least distally), finely and closely antrorsely serrulate-scabrous, the apex acuminate to a blunt scabrous tip. Inflorescence a congested obconic to spherical head of 6-16 spikelets at the summit of the culm, (1-) 1.3-1.8 × 1-2.5 cm; involucral bracts leaf-like, well-developed, ascending and arching, (4-) 5-9 (-10), the lowermost 8-32 cm × 3-13 (-16) mm, ciliate along margins at base; spikelets ovoid or rarely cylindrical, acute at apex, rounded or nearly so at base, 8-12 × 3-6 mm, short-pedicellate, often hidden except for their apices by the wide bases of the involucral bracts; scales 20-60 per spikelet, boat-shaped, keeled distally, with acute to acuminate apex, brownish white to golden brown or ferrugineous, midcosta indistinct, pale, very fine, not prolonged beyond apex, basal scales of spikelet sometimes pubescent; fertile scales ovate to ovate-lanceolate, 6-9 × 1.5-5 mm; sterile scales 1 or 2 at base, similar but smaller than the fertile, ca. 2-5 × 1.5-2 mm, these and the lowermost fertile scales sometimes sparsely ciliate on costae proximally. Stamens 3, the anthers 2.1-2.7 mm long, apiculate at apex, truncate with colorless papillae at base; style 2-branched, the branches ½ to as long as unbranched portion. Achene biconvex, very widely obovate, (0.9) 1.1-1.4 × 1-1.5 mm, bone-white to greenish grey or ferrugineous, transversely rugulose, with horizontal to arched summit; epidermal cells linear, vertically oriented; style base very shallowly triangular, 0.3-0.6 mm high, 0.9-1.4 mm wide at base; bristles absent.

Distribution: Southern Mexico, Central America (Guatemala, Honduras, Nicaragua, Costa Rica, and Panama), and northern South America (Venezuela, Guyana, Suriname, French Guiana).

Habitat in the Guianas: In wet tropical forest, on beds and along margins of creeks and streams, forest edges, and clearings, 300-550 m.

Specimens examined: FRENCH GUIANA: Environs de Filon Doyle (8 km SE de Cacao), 2 Nov 1980, *J.J. de Granville 4189* (CAY, NY, P); Région de Saül, 4.5 km Nord de Carbet Maïs, 16 Jan 1980, *J.J. de Granville 3289* (CAY, NY, P); Montagnes de la Trinité, NE summit, 500 m, 29 Jan 1984, *J.J. de Granville et al. 6367* (B, CAY, NY, P, U, US); Montagne Bellevue de l'Inini, Zone centrale, 550 m, 29 Aug 1985, *J.J. de Granville et al. 7905* (CAY, MO, NY, P, U); Mont Atachi Bacca, Région de l'Inini, versant nord, 9 km au sud-est de Gobaya Soula, Abords du camp, 03°33'N, 53°55'W, 420 m, 14 Jan 1989, *J.J. de Granville et al. 10632* (B, CAY, G, NY, P, U, US); Station des Nouragues, Bassin de l'Approuague, Arataye, Ilôt de la crique Nouragues, 04°03'N, 52°42'W, 22 Oct 1994, *B. Riéra et al. 1963* (CAY, NY, P, U, US). Station d'ecotourisme de l'Aratai, 25 m, 03°59'15"N, 53°35'20"W, 09 Nov 2001, *J.J. de Granville 14534* (CAY, U, US). GUYANA: Barima River, Mar 1896, *G.S. Jenman 6991* (NY, K); Matthews Ridge, Barima River, 300 m, 18 Jan 1955, *B. Maguire 40537* (NY); Mabura region, W Pibiri compartment, 6 mi above camp, 05°02'N, 58°38'W, 12 Oct 1993, *R.C. Ek et al. 940* (NY). SURINAME: Jandee Kreek, NE of Kabelstation, Suriname Rivier, 21 Jul 1953, *J.C. Lindeman 4439* (K, NY).

EXCLUDED SPECIES

Rhynchospora aristata Boeck., Flora 40: 36. 1857. TYPE: Mexico; Veracruz, *Sartorius s.n.* (holotype: B-herb. C.H. Schultz). *Distribution:* Mexico, Central America (Guatemala, Honduras, Nicaragua, Costa

Rica, and Panama), West Indies (Cuba and Hispaniola), and questionable for South America (see Thomas 1992). Cited by Goetghebeur & Strong in Boggan et al. (1997) as occurring in Guyana. However, no specimens have been seen in this study nor has it been recently collected there.

Rhynchospora exaltata var. microcephala Kük., Bot. Jahrb. Syst. 74: 440. 1949. Syntype: Guyana (British Guiana), *Schomburgk 809* (L). I am treating this taxon provisionally within the circumscription of *R. exaltata* Kunth until the specimen can be examined. Not found in a search at the British Museum (BM).

Rhynchospora filifolia A. Gray. Cited by Lindeman & Van Donselaar (1971) as occurring in Suriname. However the specimens cited (*Lanjouw & Lindeman 953a, 1002*) are both *Rhynchospora harperi* Small.

Rhynchospora hieronymii Boeck., Beitr. Cyp. 1: 30. 1888. Type: Argentina; Tucumán, *Hieronymus & Lorentz 821* (holotype: B, destroyed, photo US ex B). *Distribution:* Central America (Guatemala, Costa Rica, and Panama) and South America (Venezuela, southern Brazil, Uruguay, and northern Argentina). Cited by Goetghebeur & Strong in Boggan et al. (1997) as occurring in Guyana. However, no specimens have been

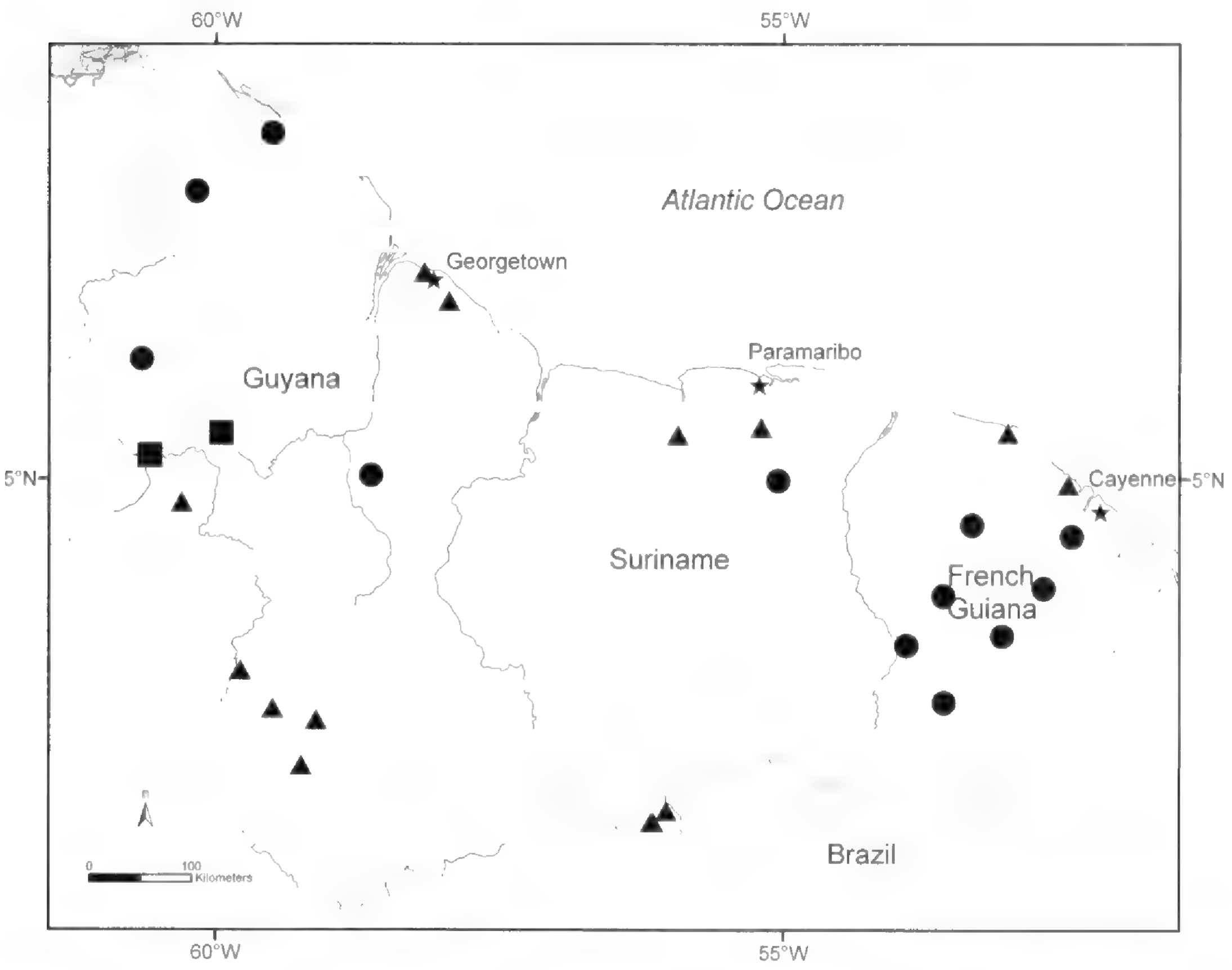

Fig. 51. Distribution of ■*Rhynchospora tuerckheimii*, ▲*R. velutina*, and ●*R. watsonii* in the Guianas.

seen in this study nor has it been recently collected there.

Rhynchospora macrochaeta Steud. ex Boeck., Linnaea 37: 632. 1873. TYPE: Peru, *Lechler 1819* (holotype: B, destroyed; isotypes: G!, K, P). *Distribution:* Central America (Costa Rica) and South America (Colombia, Venezuela, Peru, Bolivia). Cited by Goetghebeur & Strong in Boggan et al. (1997) as occurring in Guyana. However, no specimens have been seen in this study nor has it been recently collected there.

Rhynchospora robusta (Kunth) Boeck., Linnaea 37: 616. 1873. *Dichromena robusta* Kunth, Enum. Pl. 2:283. 1837. TYPE: Brazil; "Brasilia meridionalis," *Sellow s.n.* (holotype: B, destroyed). *Distribution:* Southern Mexico, Central America, and South America. Cited by Goetghebeur & Strong in Boggan et al. (1997) as occurring in Guyana. However, no specimens have been seen in this study nor has it been recently collected there. Hardly distinct from *Rhynchospora velutina* (Kunth) Boeck.

CONCLUSION

Based on achene (fruit) epidermal features utilizing recently developed electron microscopy technology, detailed morphological descriptions of each taxon, habitat characterizations, and distribution patterns, this study has reevaluated and circumscribed eighty taxa in nineteen sections (tribes) of *Rhynchospora*, one of which, section *Stipitatae* M. T. Strong is newly described. As well as these, this work clarifies the taxonomy of all the known species in the three Guianas, whereas previously, species had been treated only for one of the countries, Suriname. It includes 164 micrographs of achenes and surface features, few of which have been illustrated previously in the literature and then only with line drawings. Advances are made in clarifying sectional and species limits in *Rhynchospora*. Although at most, only ½ of the species compliments for a particular section occur in the Guianas, species characteristics, particularly achene epidermal features (where there are several or more species available for comparison) were evaluated and discussion provided bearing on the delimitation of sections. At the species level, the micrographs of achenes and surface features, full detailed descriptions for each taxon, and habitat characterizations have led to the discovery of characteristics not previously recorded in the literature, and in turn have provided evidence for more definitive circumscriptions of the species to be made. In several cases, infraspecific taxa were shown to be better treated at the species level because of distinct morphological features and exhibiting different habitat preferences. Eight of the taxa treated are known to be economically important species at the regional or local level and increased knowledge of their characteristics, habitat, and distribution is important to local economies.

The habitat and distribution portion of this study as well as notes on worldwide distribution provide information on where a particular species can be found, how rare or common it may be, or whether it is endemic, adventive, or invasive (non-native to the area). This is of importance when evaluating areas for preservation that are high in native species diversity or endemicity, such as the study previously cited in the Introduction that assessed critical areas in Guyana for possible consideration as protected natural areas.

Overall, this work will be useful as a reference for botanists, ecologists, and systematists alike, working to assess the sedge (Cyperaceae) flora of particular habitats in this region, particularly savanna habitats and will ultimately be used within the broader context of a flora of the three Guianas being done by a consortium of institutions coordinated by the Smithsonian Institution, Washington, DC, and the University of Utrect, the Netherlands.

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SCANNING ELECTRON MICROGRAPHS OF ACHENES

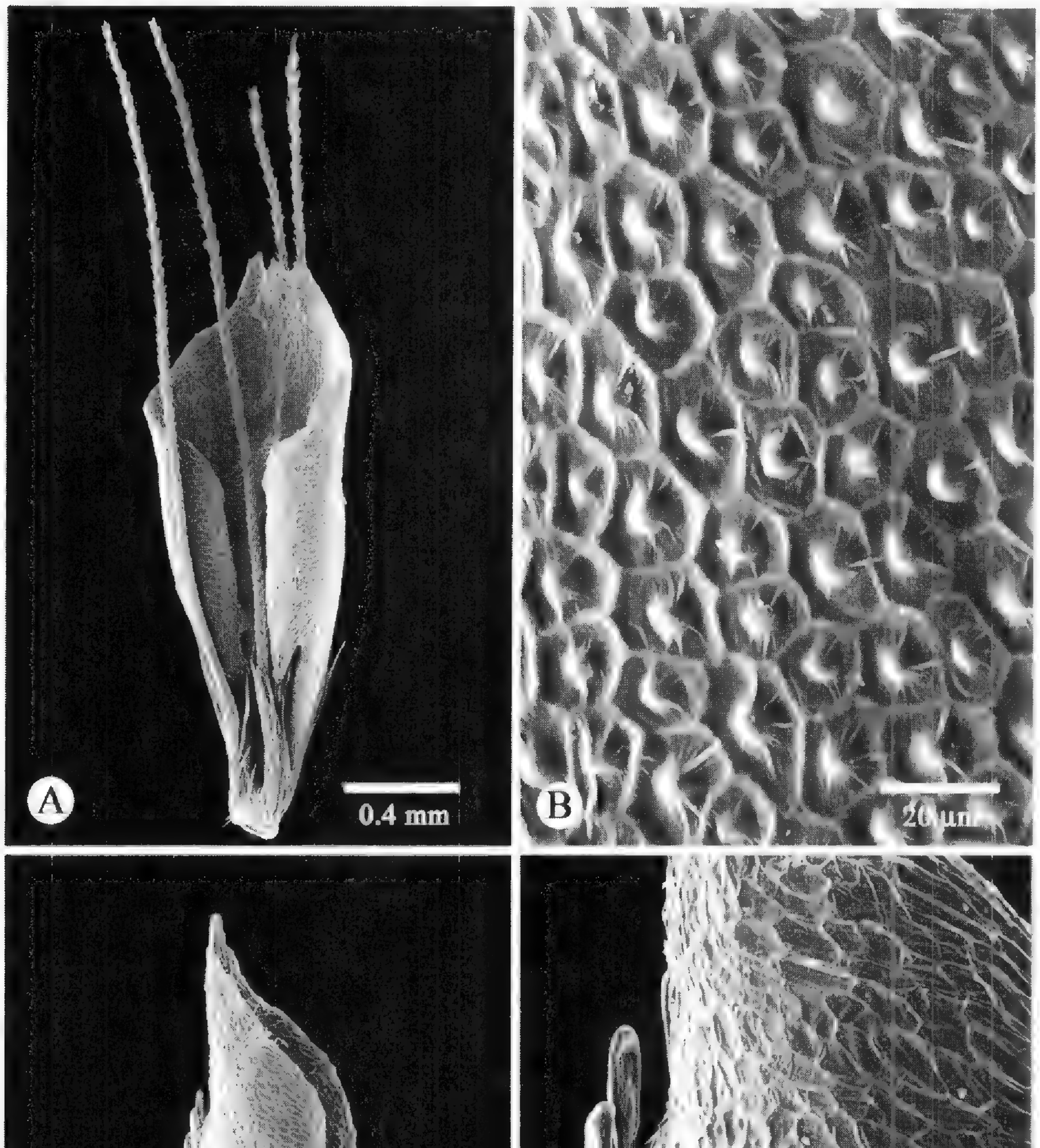


Fig. 52. A-D. *Rhynchospora barbata*. A. fully winged achene. B. detail of pericarp. C. partially winged achene. D. detail of reticulated wing and elongated papillae. (A, from *Hahn 4074*, US; B-D, from *Lindeman 4256*, US).

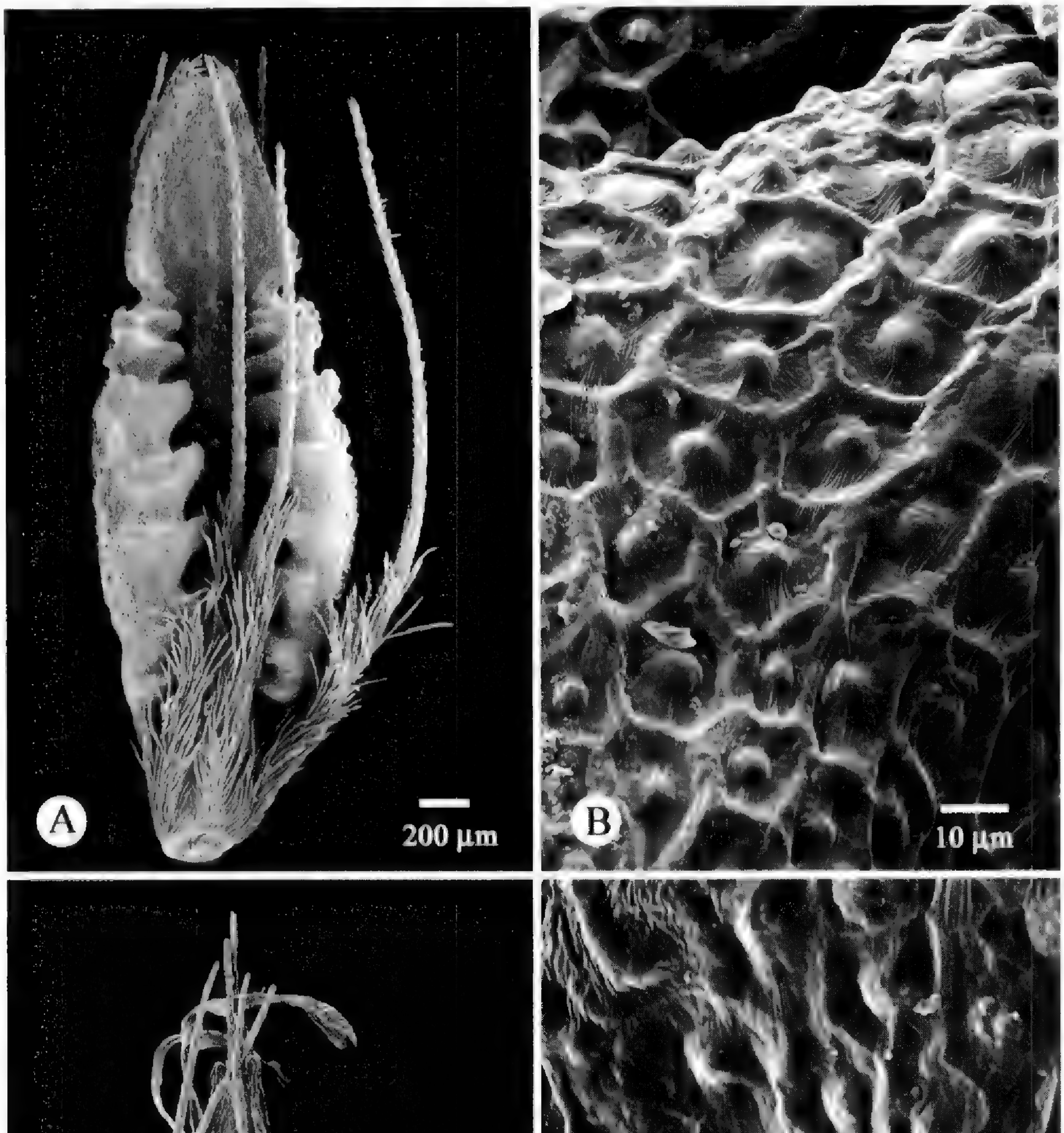


Fig. 53. A-B. *Rhynchospora trichochaeta*. A. achene. B. detail of pericarp. C-D. *Rhynchospora subplumosa*. C. achene. D. detail of pericarp. (A-B, from *Henkel 5847*, US; C-D, from *McDowell 2498*, US).

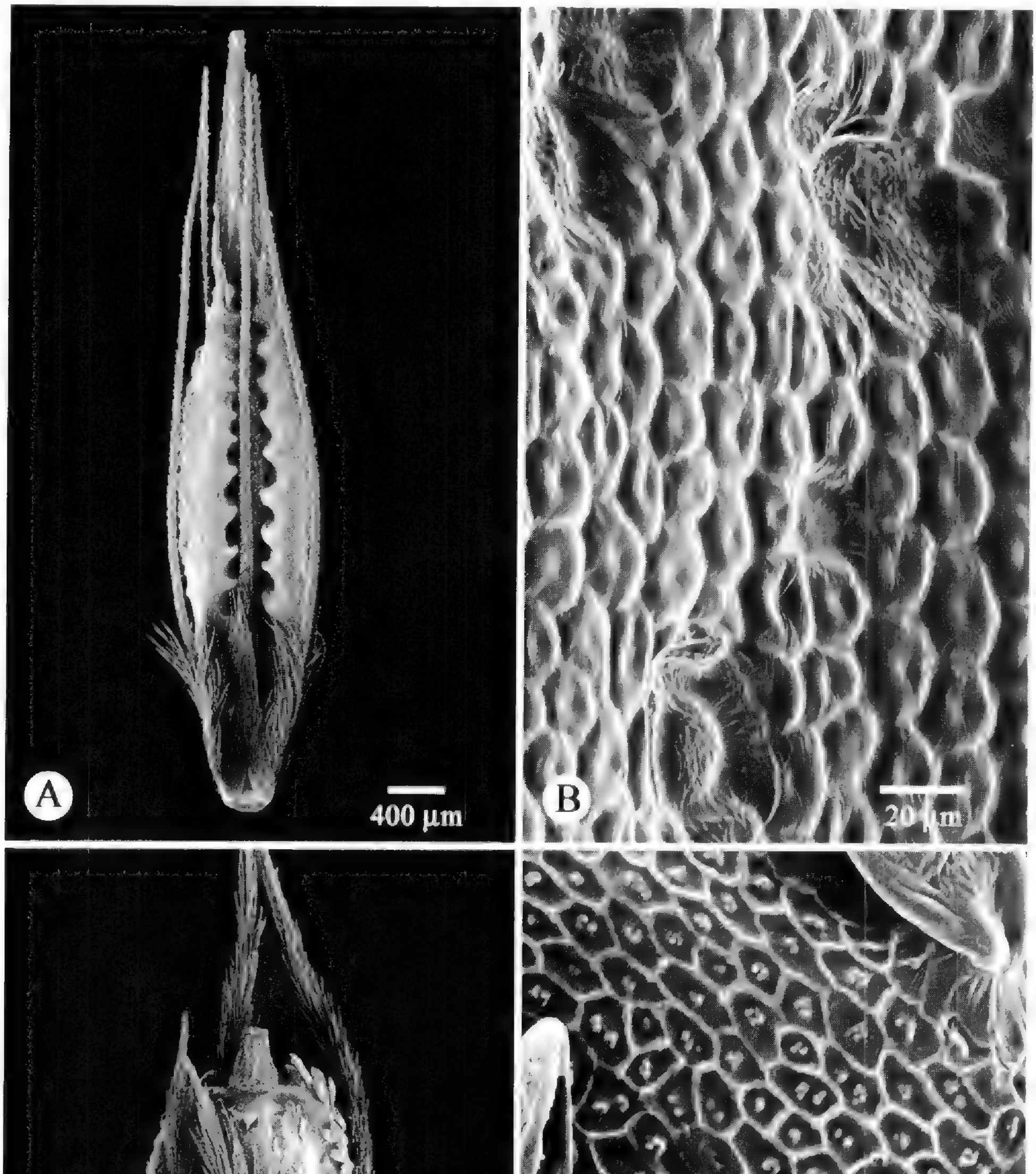
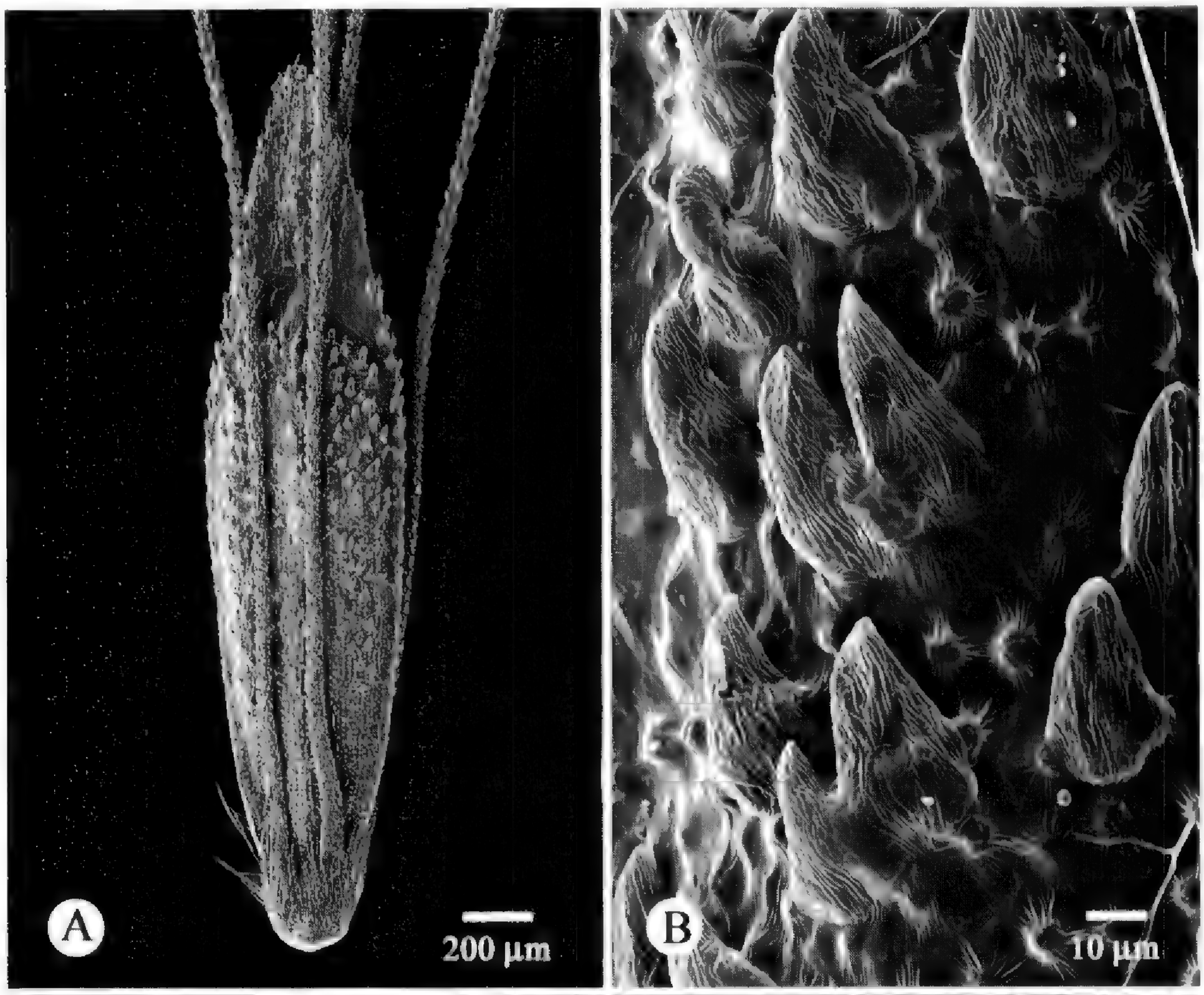


Fig. 54. A-B. *Rhynchospora dentimux*. A. achene. B. detail of pericarp. C-D. *Rhynchospora curvula*. C. achene. D. detail of pericarp. (A-B, from *Cremers & deGranville 13979*, US; C-D, from *Jansen-Jacobs 4049*, US).



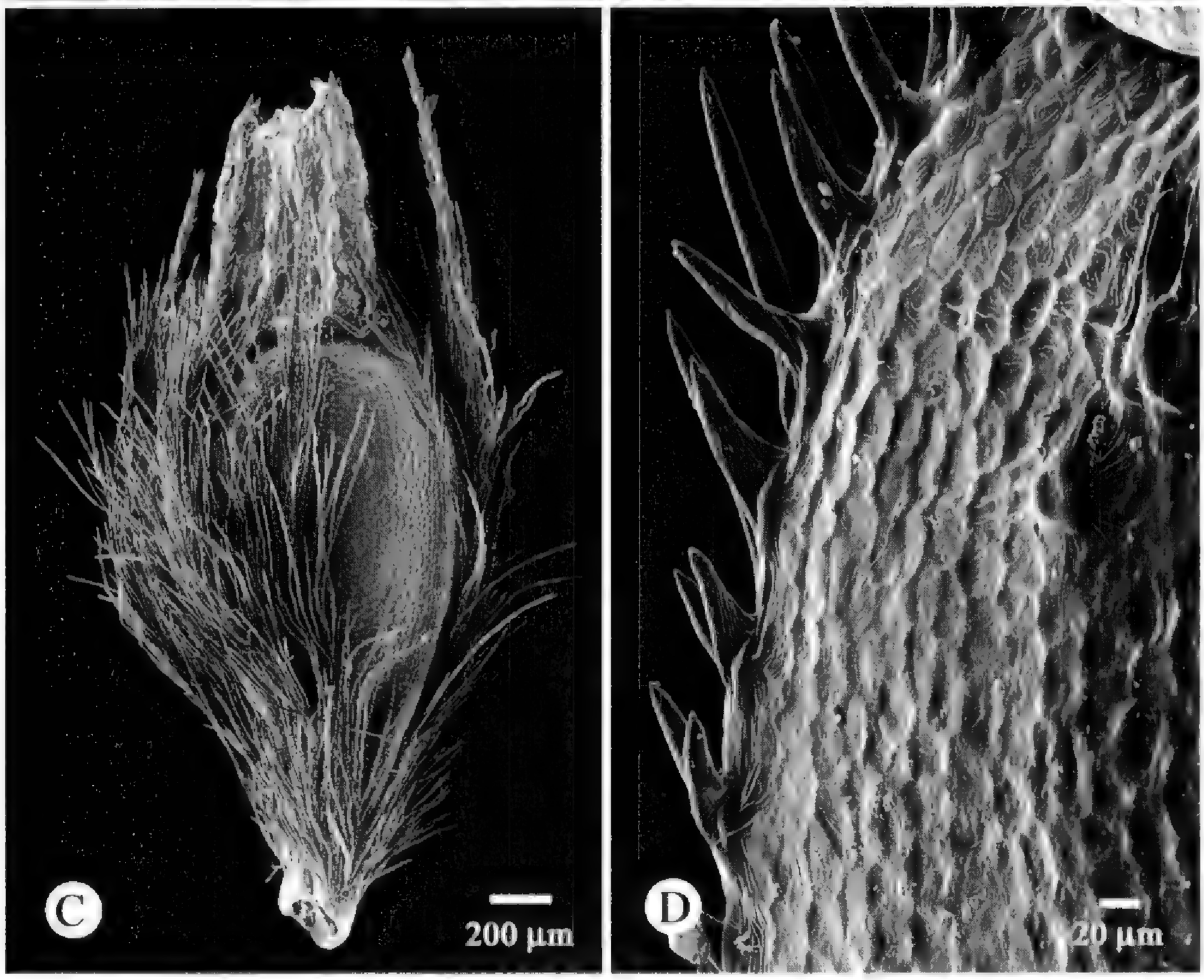


Fig. 55. A-B. *Rhynchospora armeroides*. A. achene. B. detail of pericarp. C-D. *Rhynchospora globosa*. C. achene. D. detail of pericarp. (A-B, from *Goodland 600*, US; C-D, from *Pipoly 11619*, US).

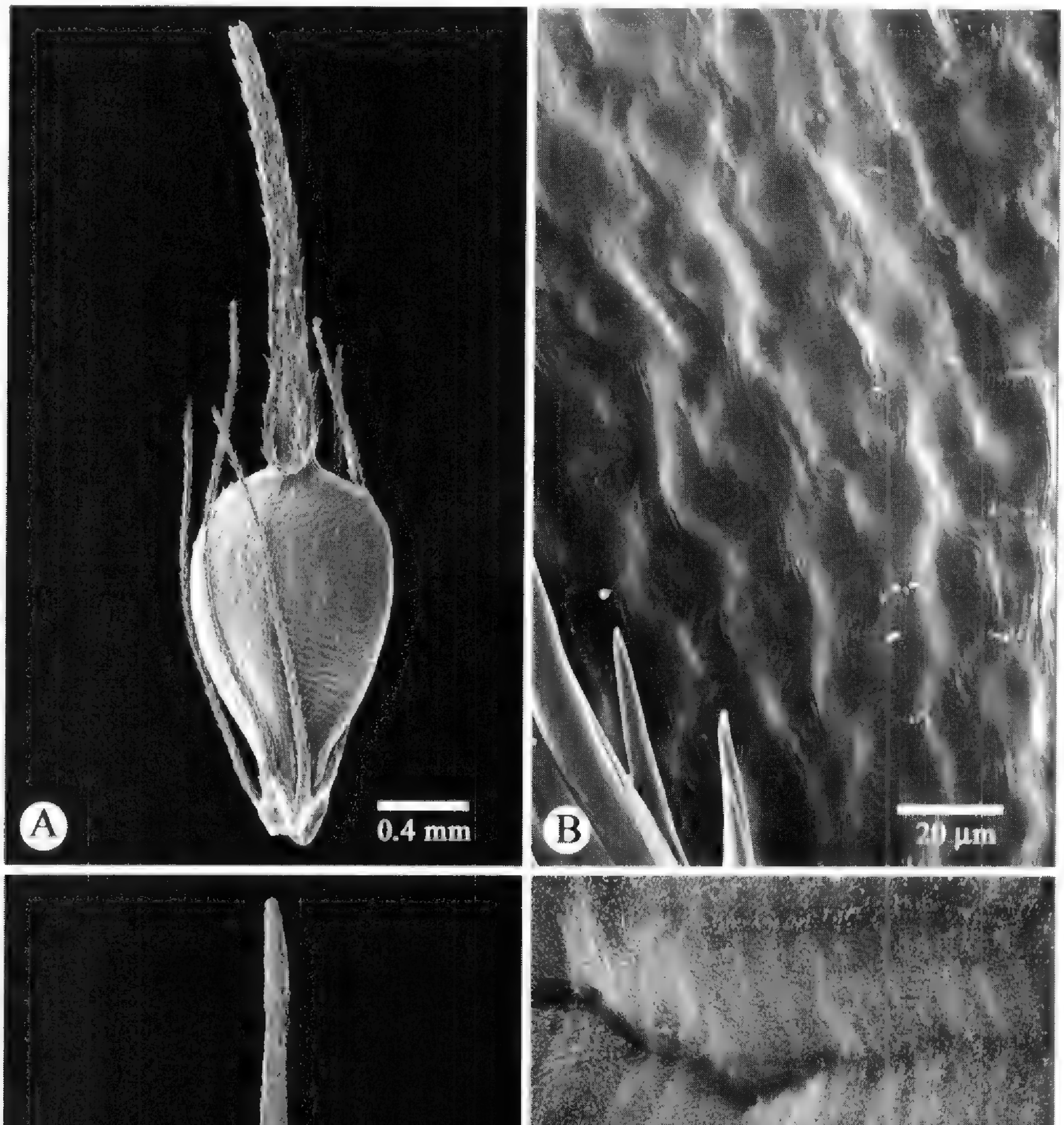
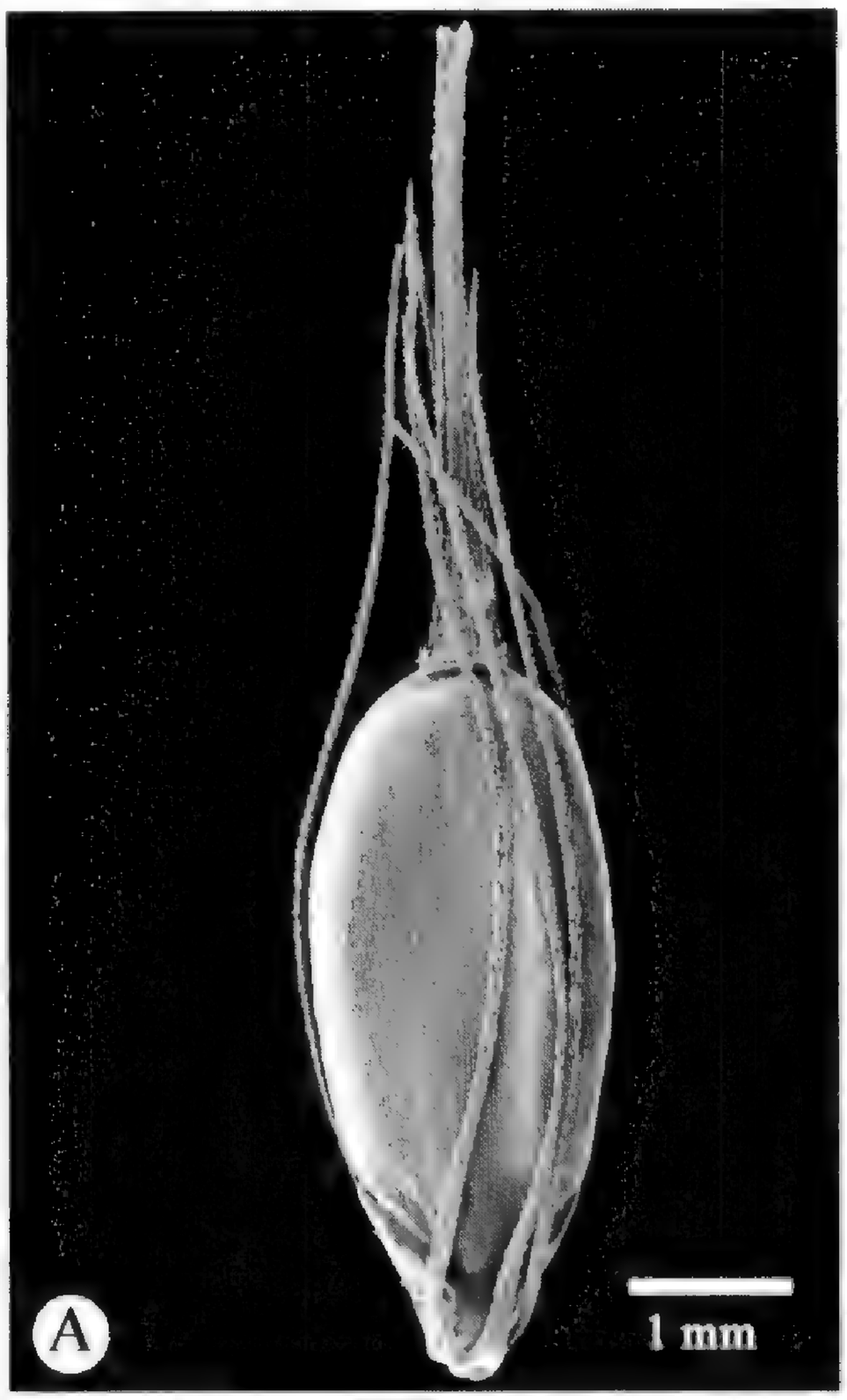
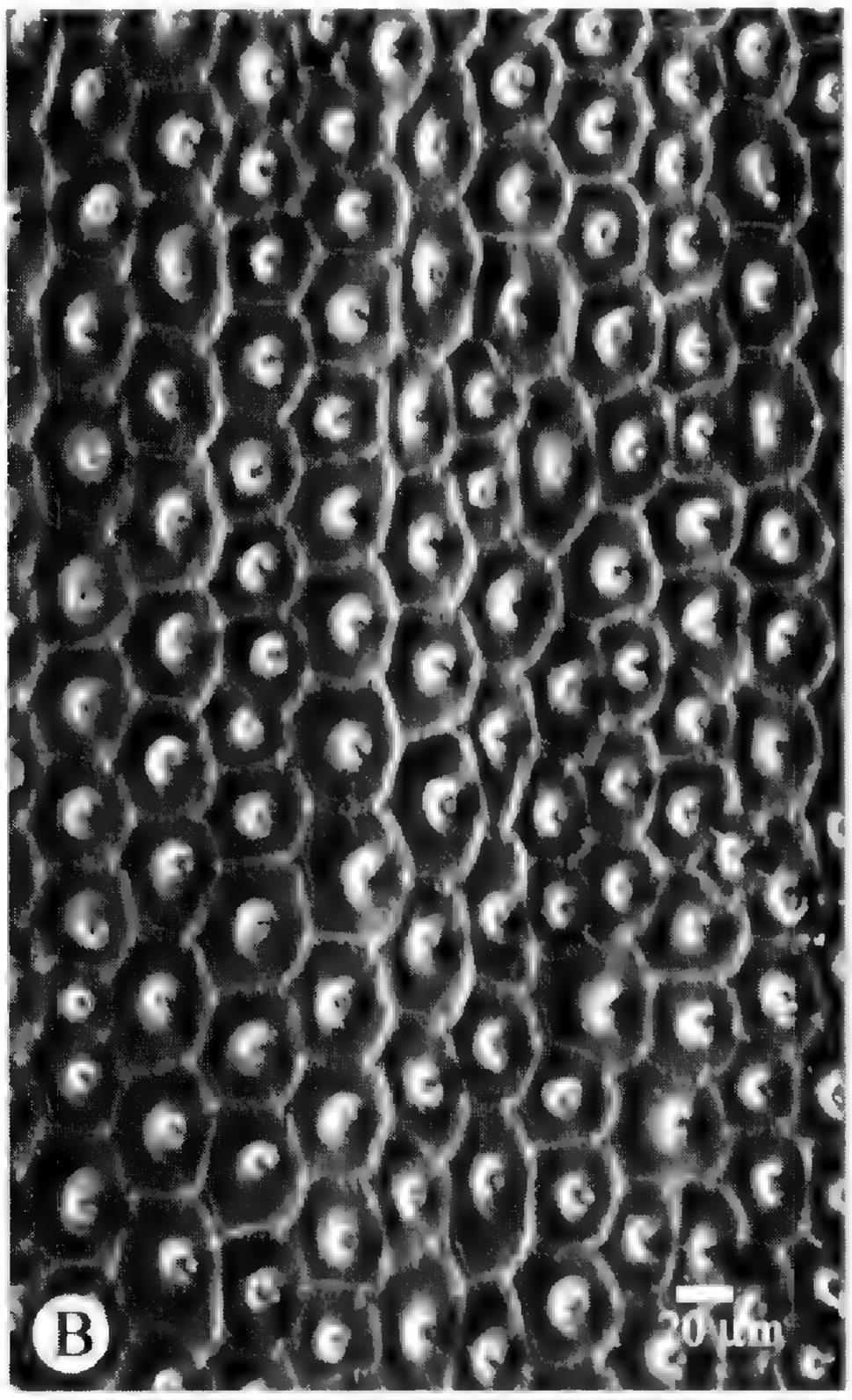
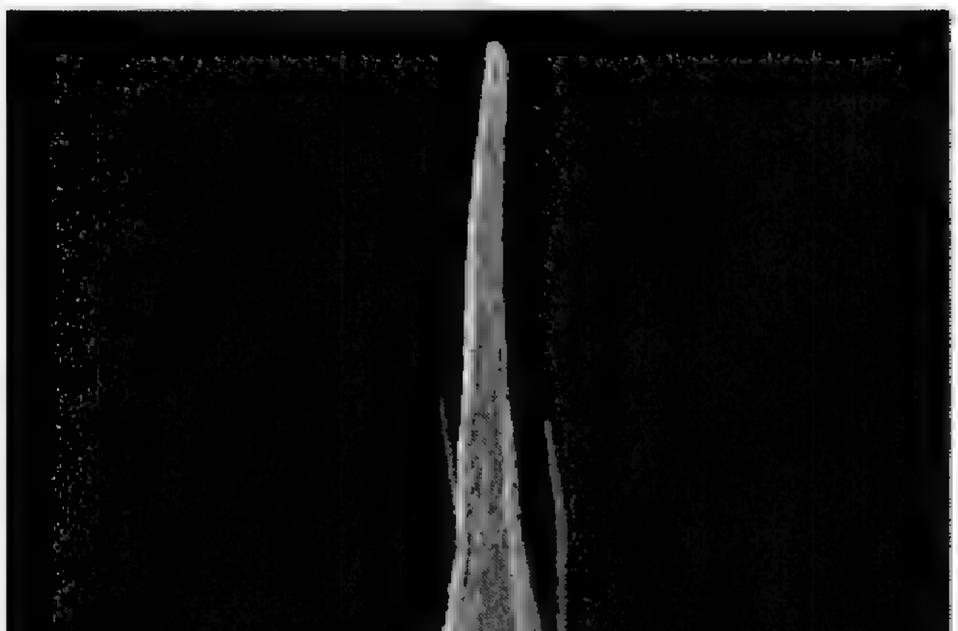


Fig. 56. A-B. *Rhynchospora holoschoenoides*. A. achene. B. detail of pericarp. C-D. *Rhynchospora triflora*. C. achene. D. detail of pericarp. (A-B, from *Horn 11003*, US; C-D, from *Teunissen 15500*, U).







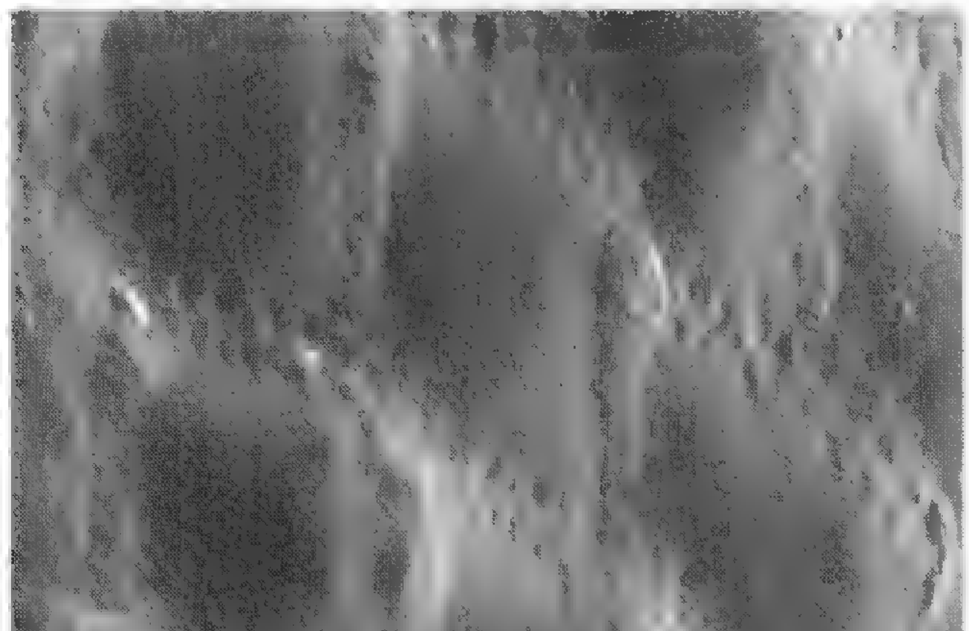


Fig. 57. A-B. *Rhynchospora hassleri*. A. achene. B. detail of pericarp. C-D. *Rhynchospora trispicata*. C. achene. D. detail of pericarp. (A-B, from *De La Cruz 4064*, US; C-D, from *Horn et al. 10089*, US).

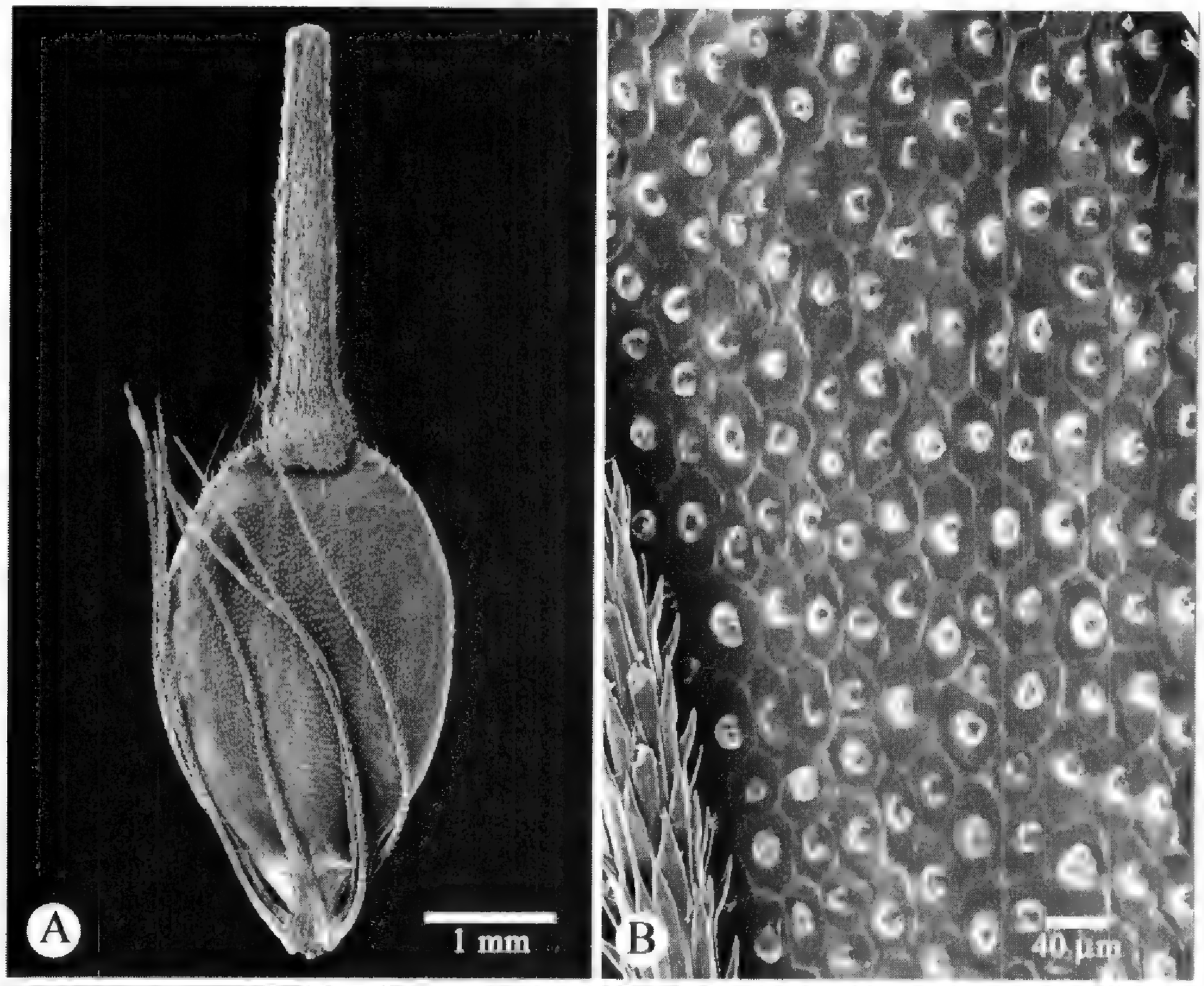


Fig. 58. A-B. *Rhynchospora amazonica* subsp. *amazonica*. A. achene. B. detail of pericarp. C-D. *Rhynchospora amazonica* subsp. *guianensis*. C. achene. D. detail of pericarp. (A-B, from *Clarke 1478*, US; C-D, from *Baldwin 3540*, US).

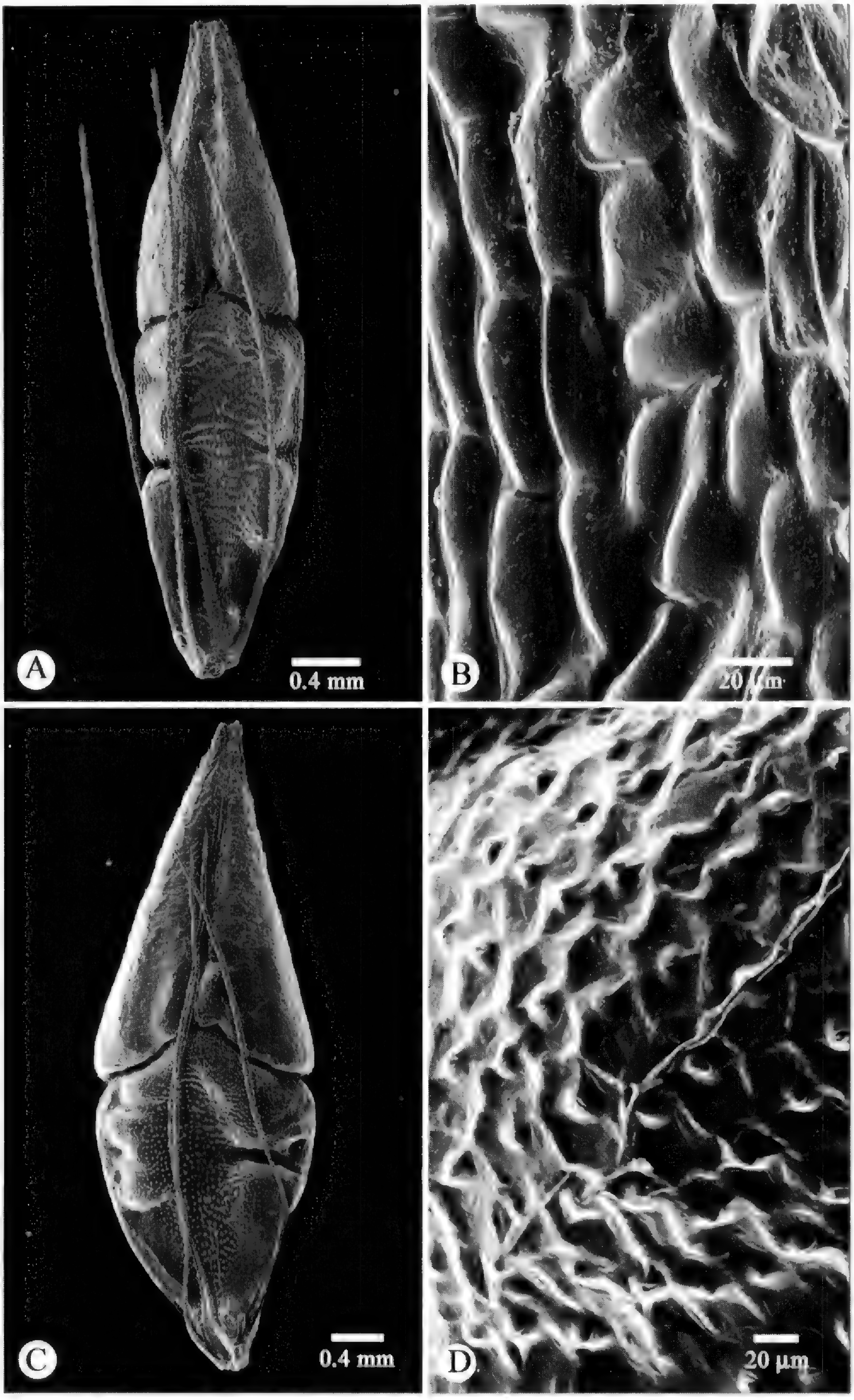
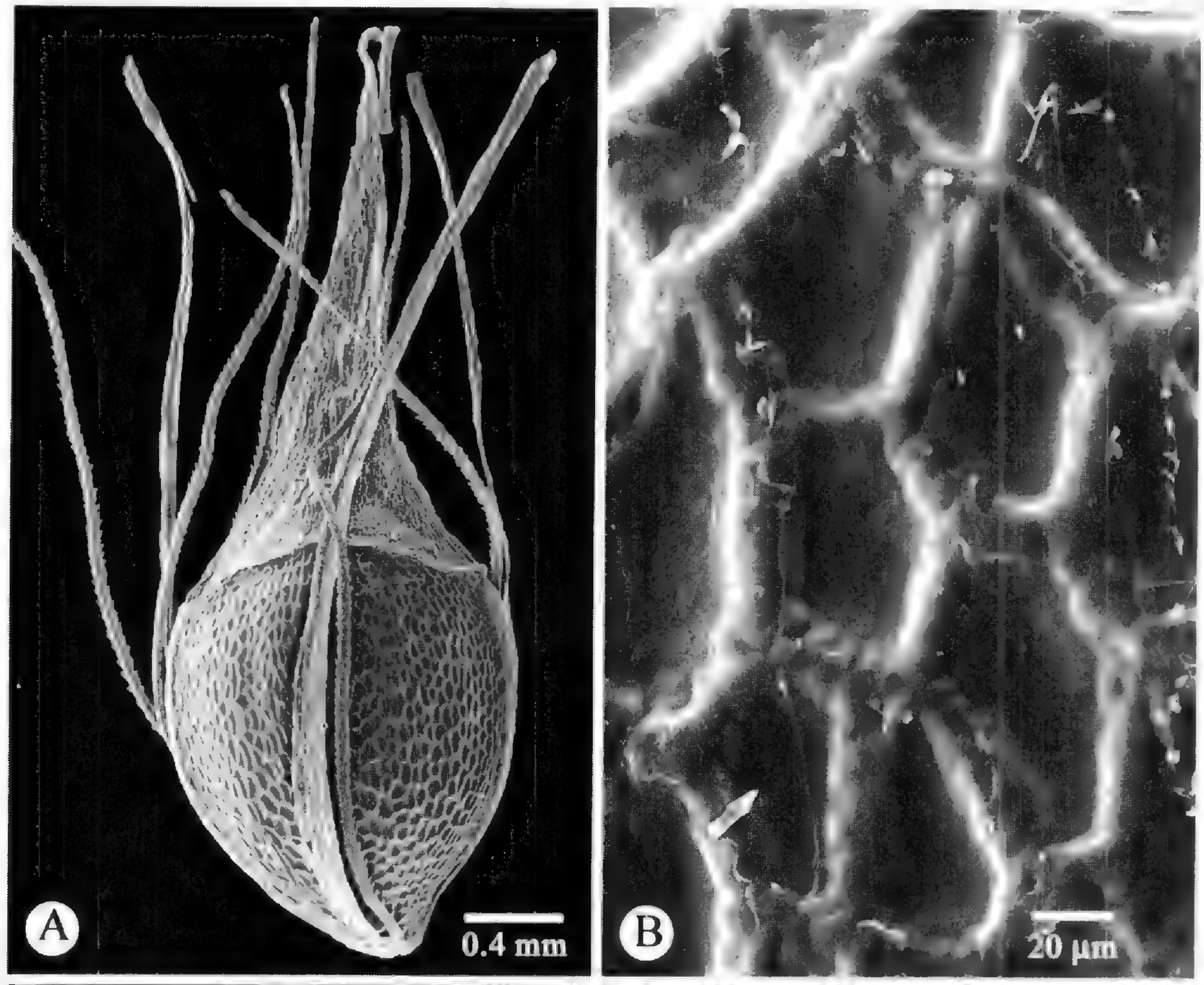


Fig. 59. A-B. *Rhynchospora gigantea*. A. achene. B. detail of pericarp. C-D. *Rhynchospora corymbosa*. C. achene. D. detail of pericarp. (A-B, from *Hoffman 782*, US; C-D, from *Pipoly 11260*, US).



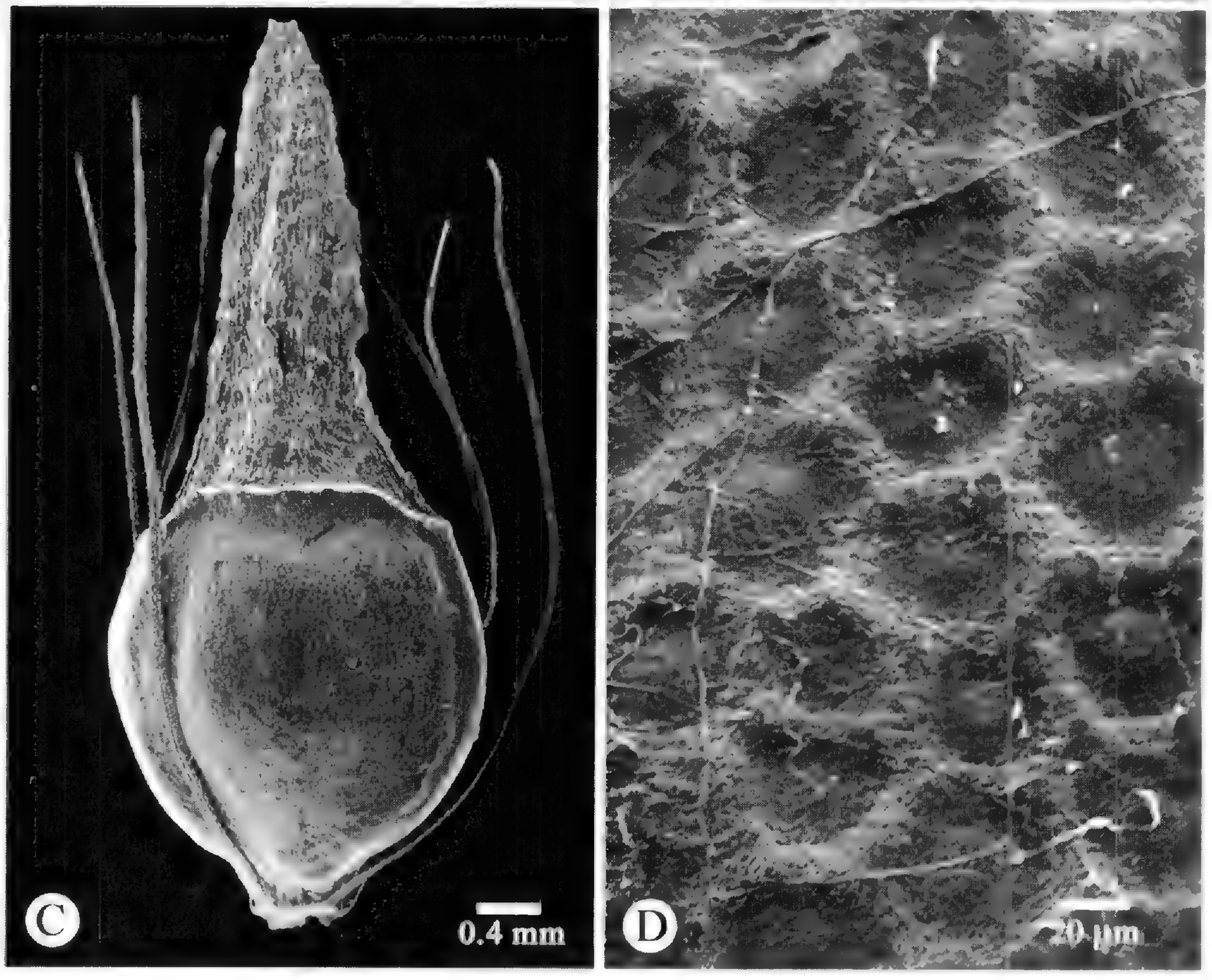


Fig. 60. A-B. *Rhynchospora albomarginata*. A. achene. B. detail of pericarp. C-D. *Rhynchospora comata*. C. achene. D. detail of pericarp. (A-B, from *Hoff 7406*, US; C-D, from *Cremers 8068*, CAY).

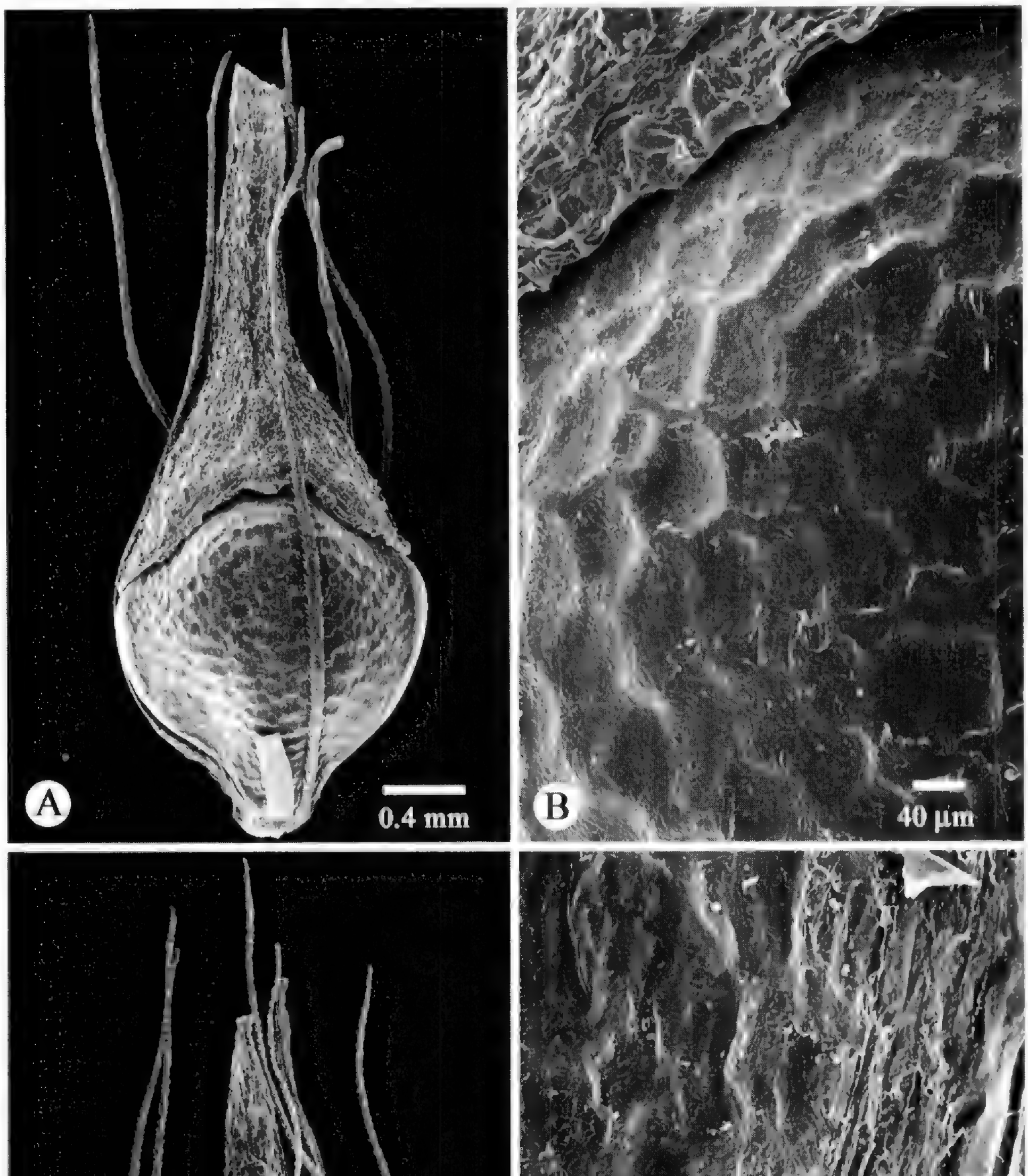


Fig. 61. A-B. *Rhynchospora cephalotes*. A. achene. B. detail of pericarp. C-D. *Rhynchospora pubisquama*. C. achene. D. detail of pericarp. (A-B, from *Hoffman 1034*, US; C-D, from *Maguire 24559*, F).

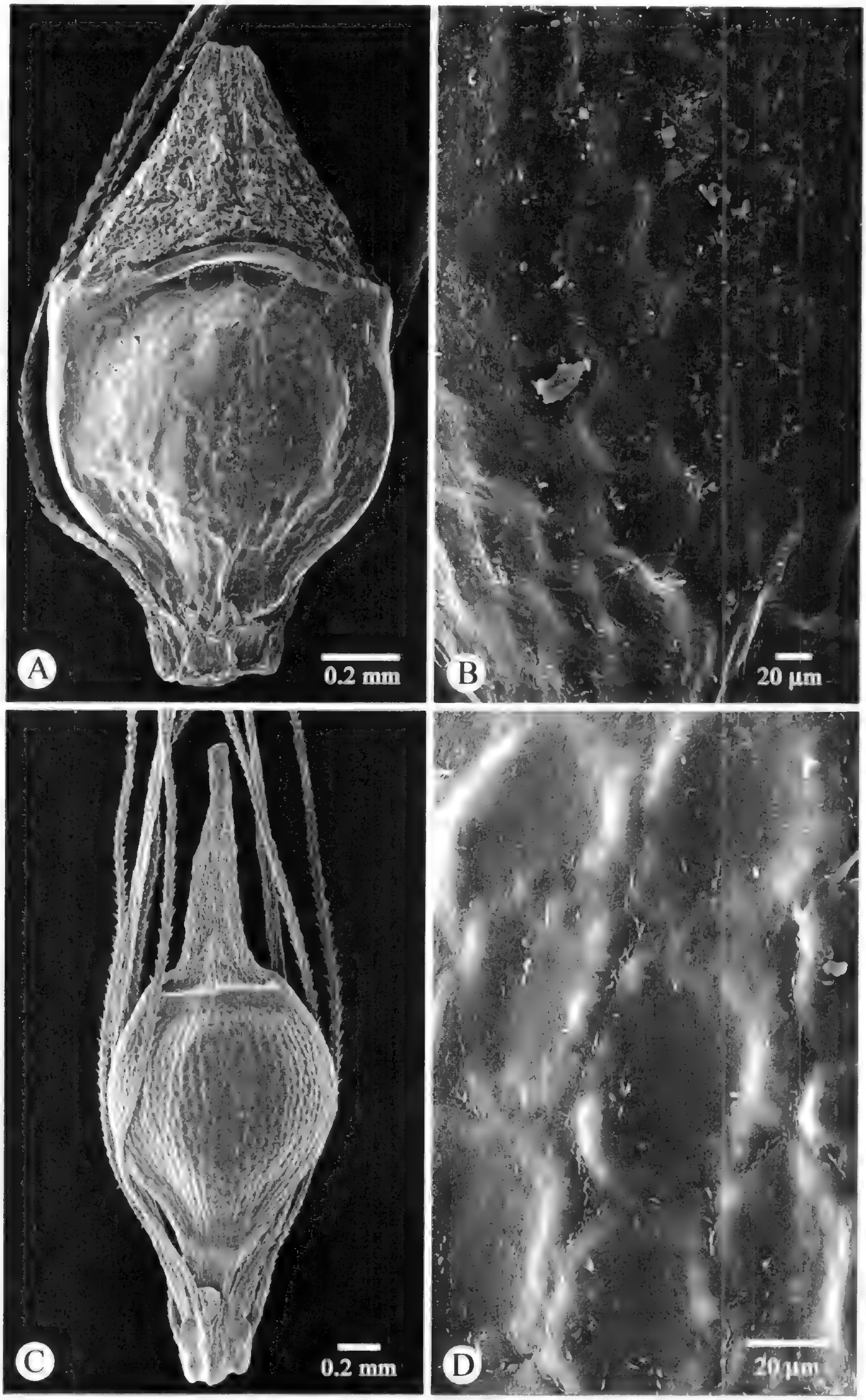


Fig. 62. A-B. *Rhynchospora bakuisensis*. A. achene. B. detail of pericarp. C-D. *Rhynchospora ayangannensis*. C. achene. D. detail of pericarp. (A-B, from *Florschütz & Maas 2954*, U; C-D, from *Henkel 88*, US).

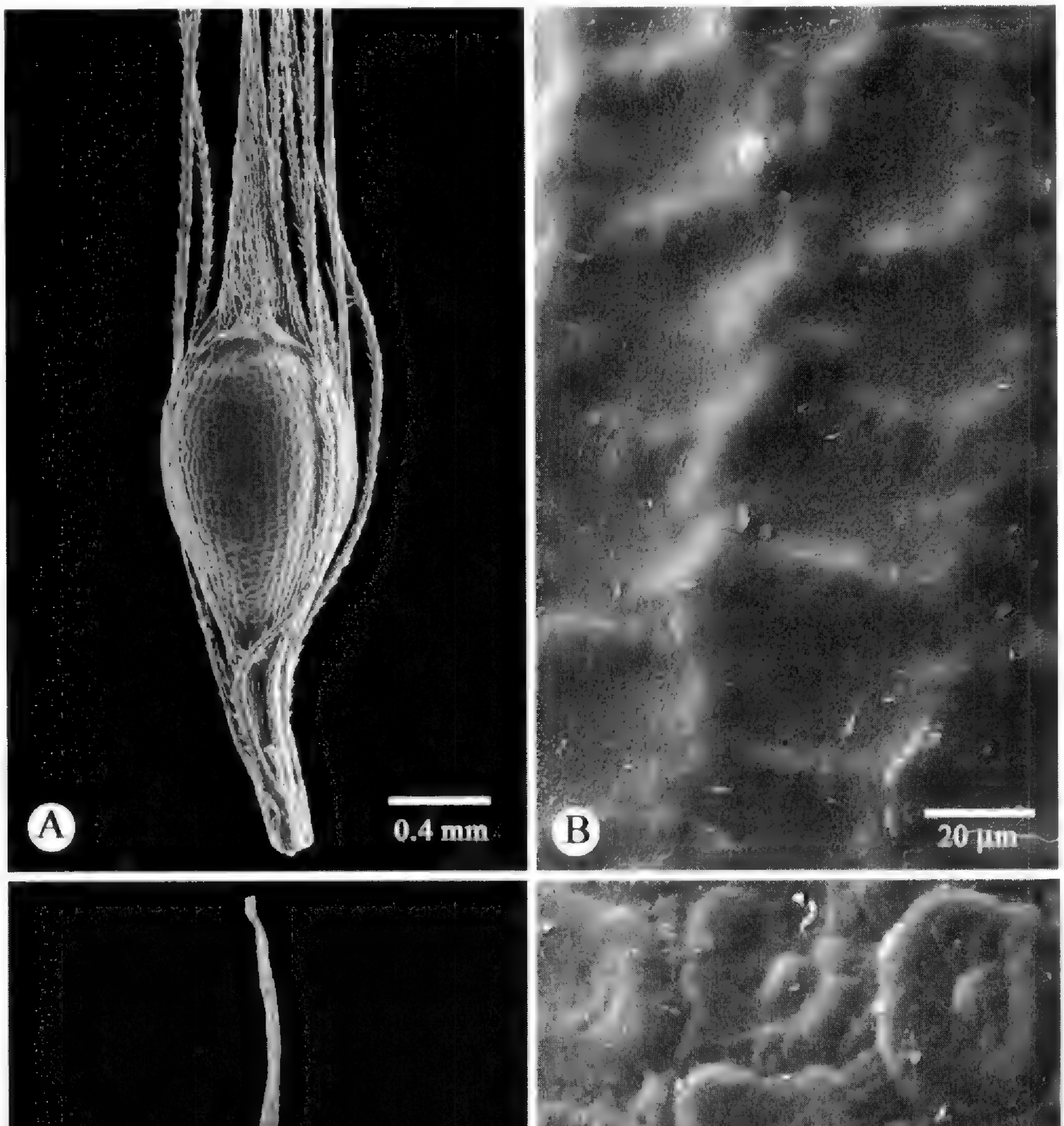


Fig. 63. A-B. *Rhynchospora bolivarana*. A. achene. B. detail of pericarp. C-D. *Rhynchospora angustipaniculata*. C. achene. D. detail of pericarp. (A-B, from *Clarke 5472*, US; C-D, from *Hahn 4374*, US).

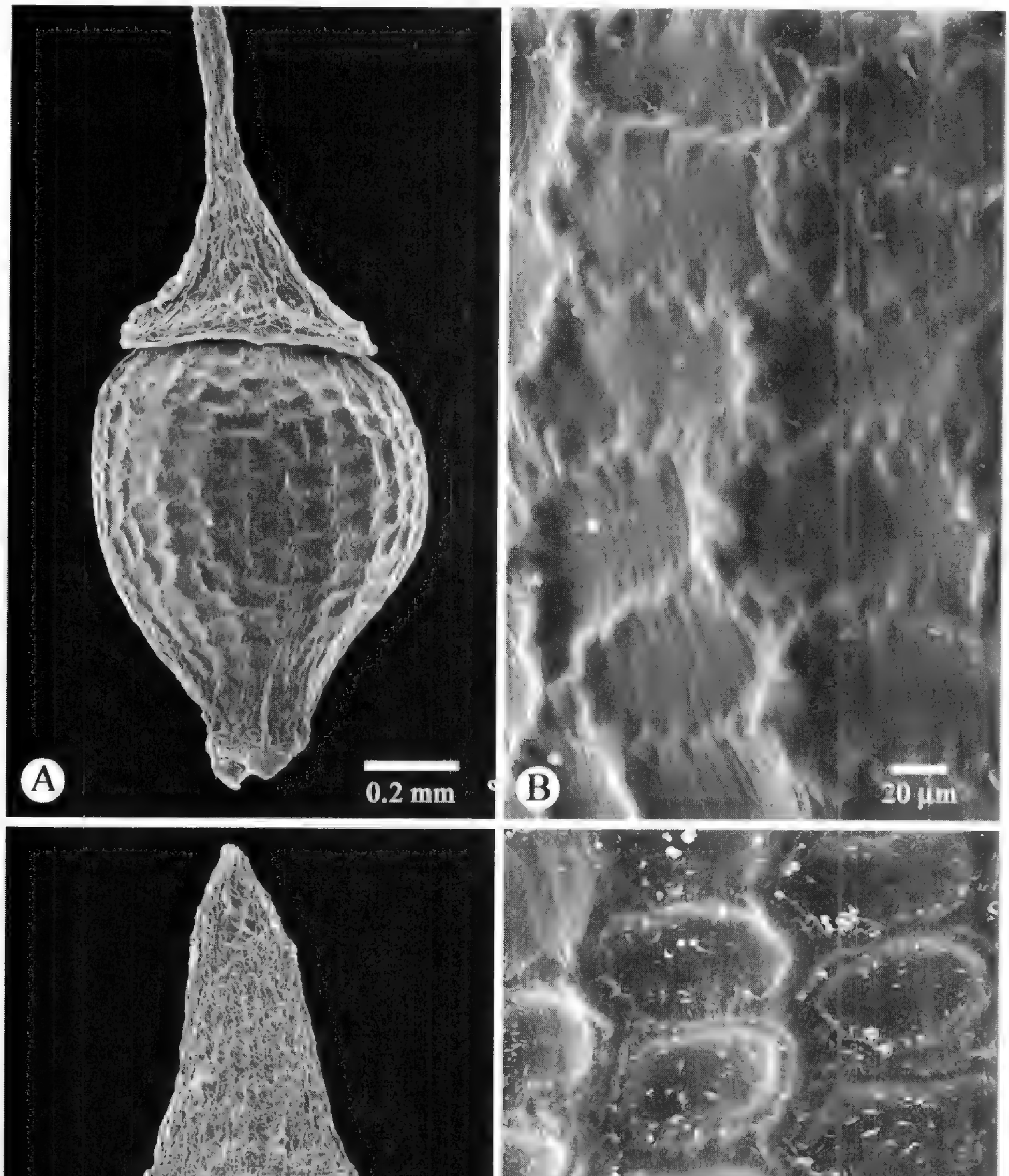


Fig. 64. A-B. *Rhynchospora polyphylla.* A. achene. B. detail of pericarp. C-D. *Rhynchospora tuerckheimii.* C. achene. D. detail of pericarp. (A-B, from *Appun 1229*, NY; C-D, from *Hoffman 3275*, U, US).

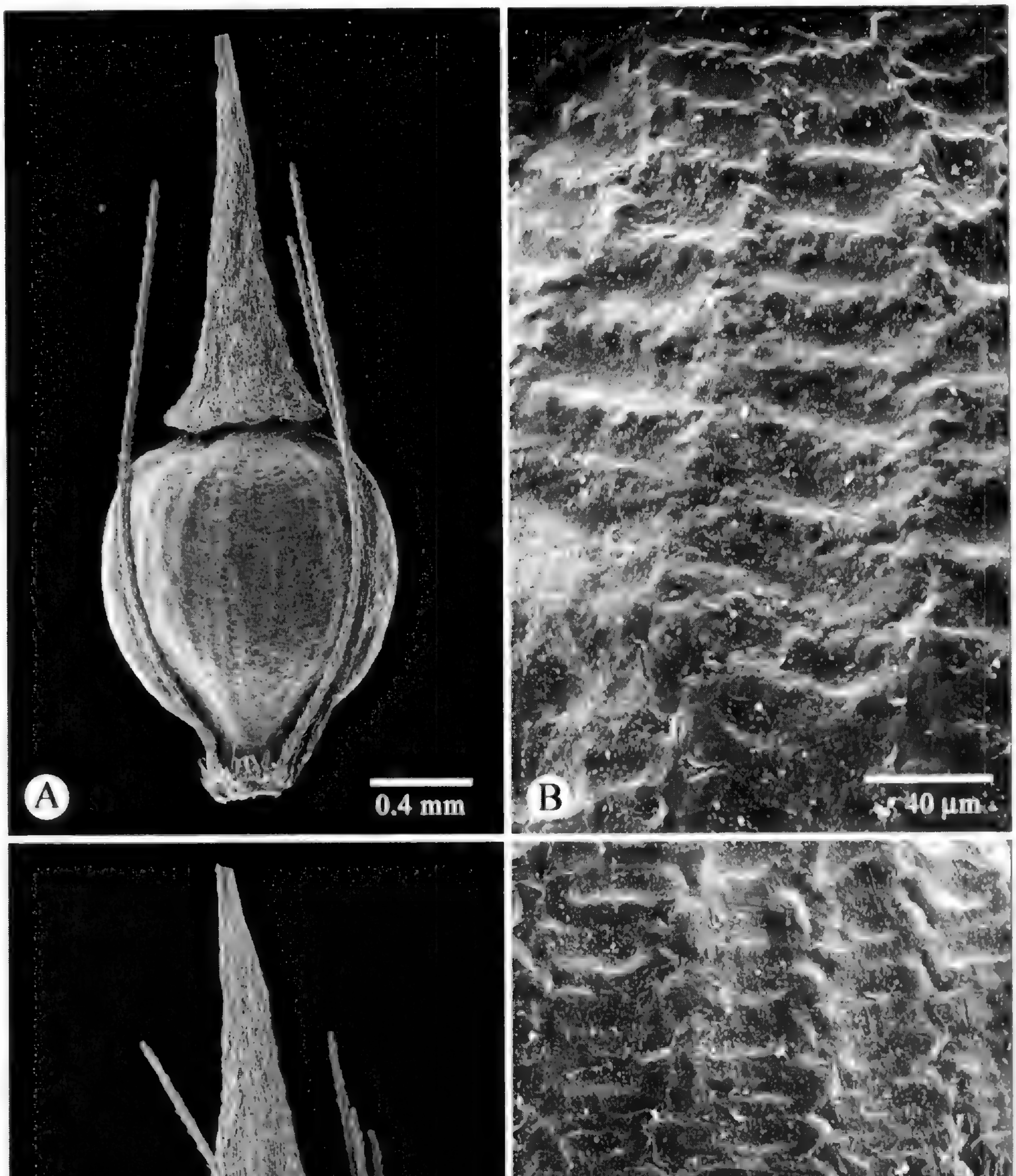


Fig. 65. A-D. *Rhynchospora immensa*. A. achene. B. detail of pericarp. C. achene. D. detail of pericarp. (A-D, from *Henkel 1492*, US).

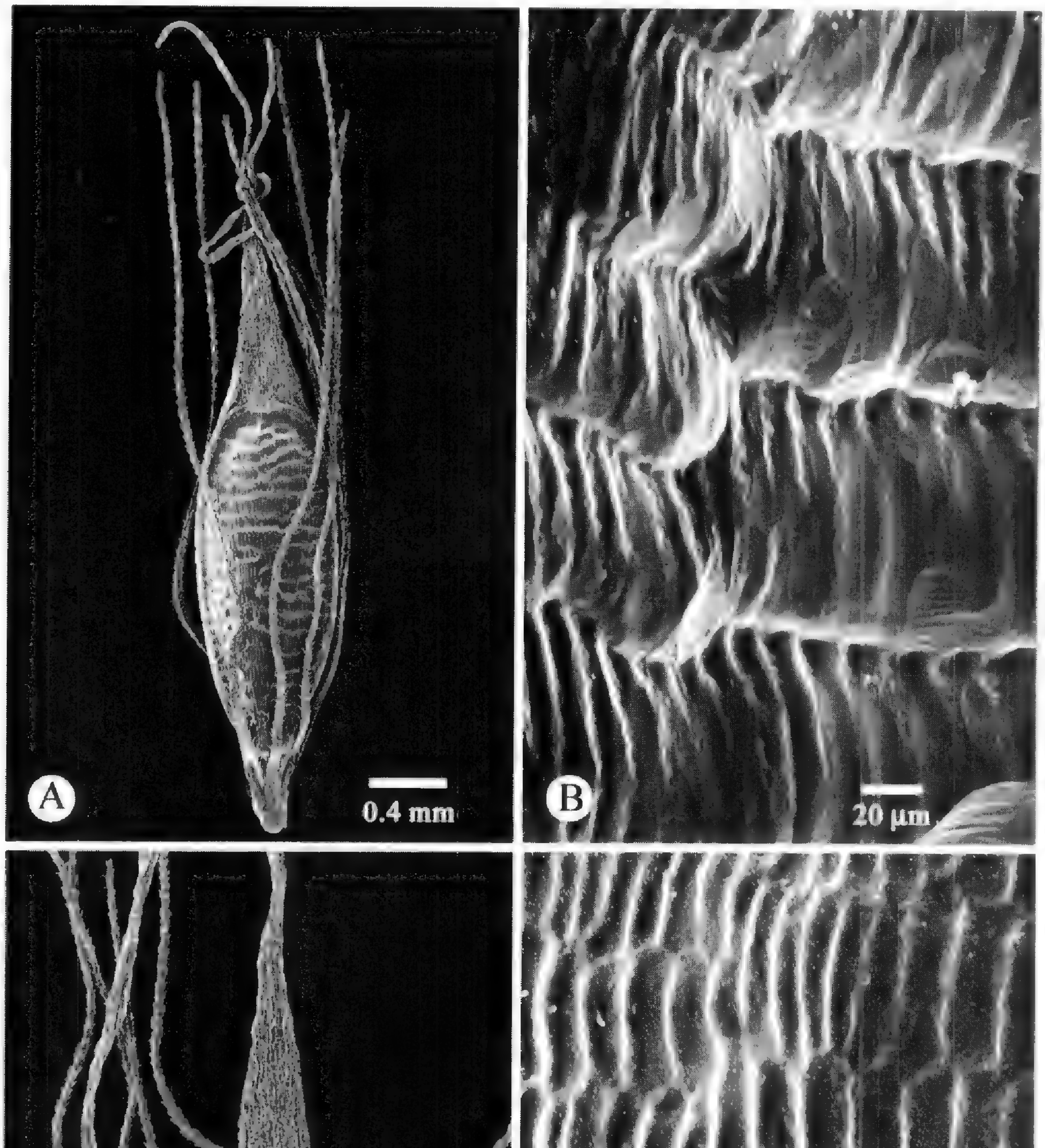
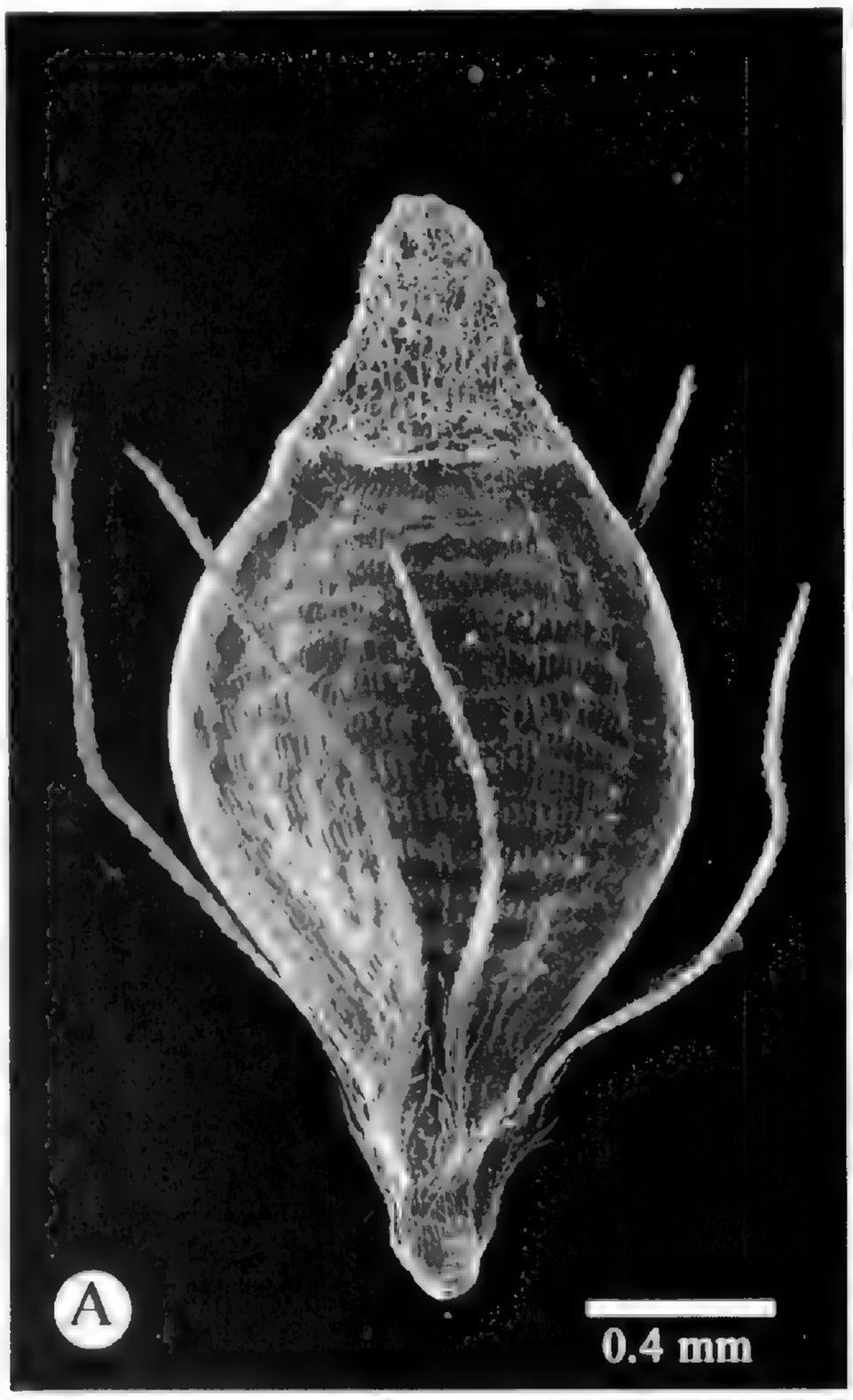
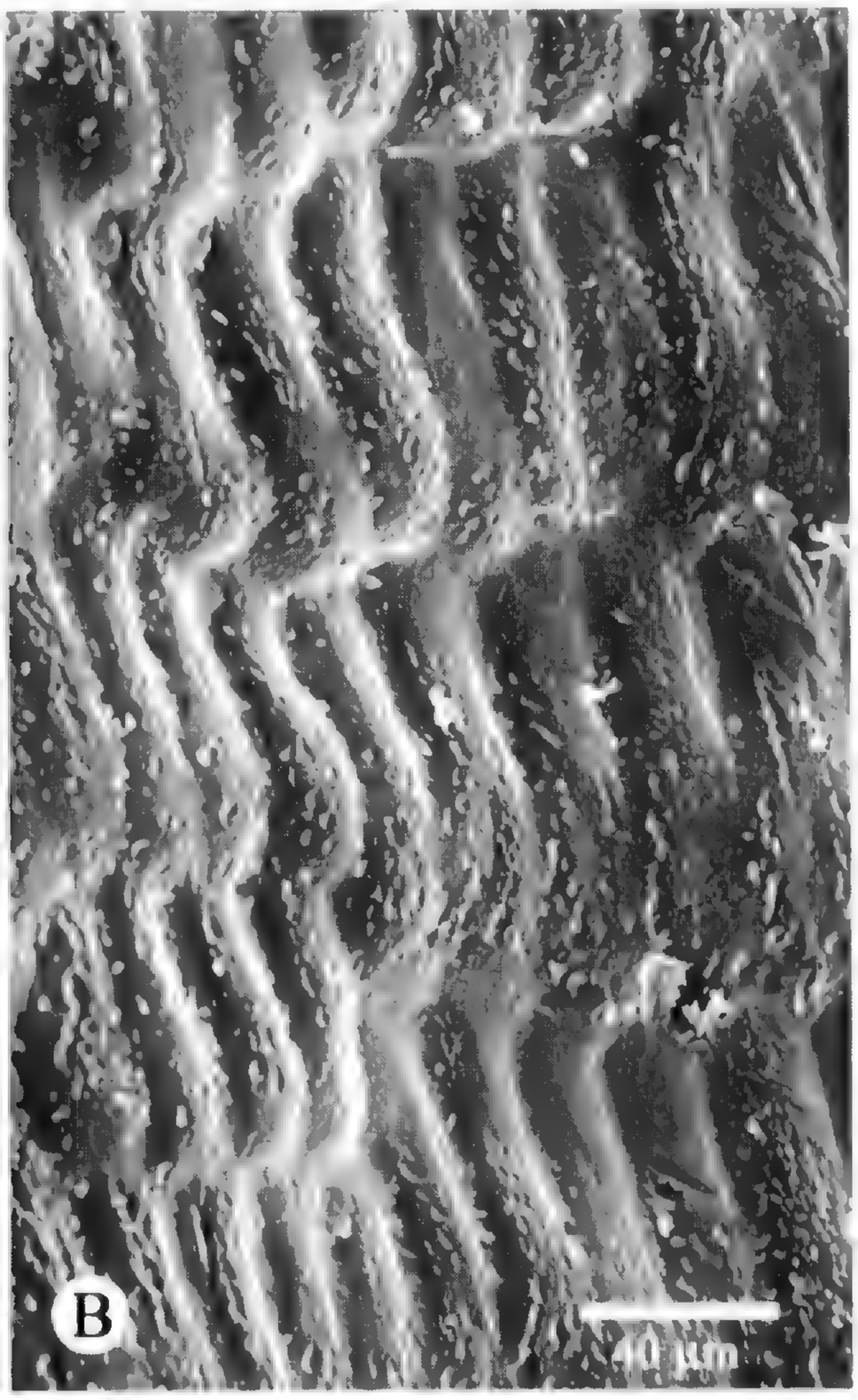


Fig. 66. A-B. *Rhynchospora brasiliensis*. A. achene. B. detail of pericarp. C-D. *Rhynchospora marisculus*. C. achene. D. detail of pericarp. (A-B, from *L.B. Smith et al. 14578*, US; C-D, from *Hoffman 2844*, US).





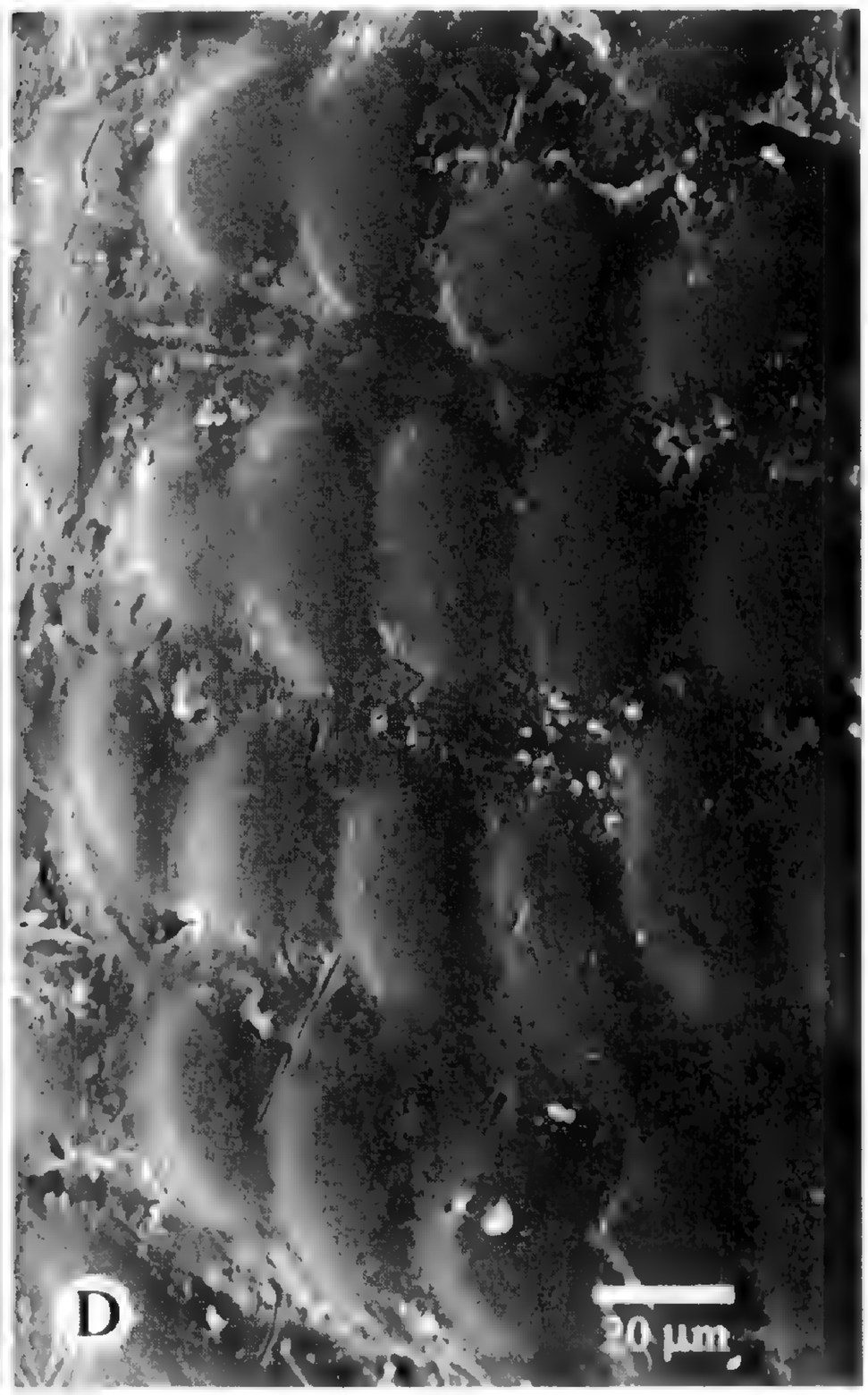
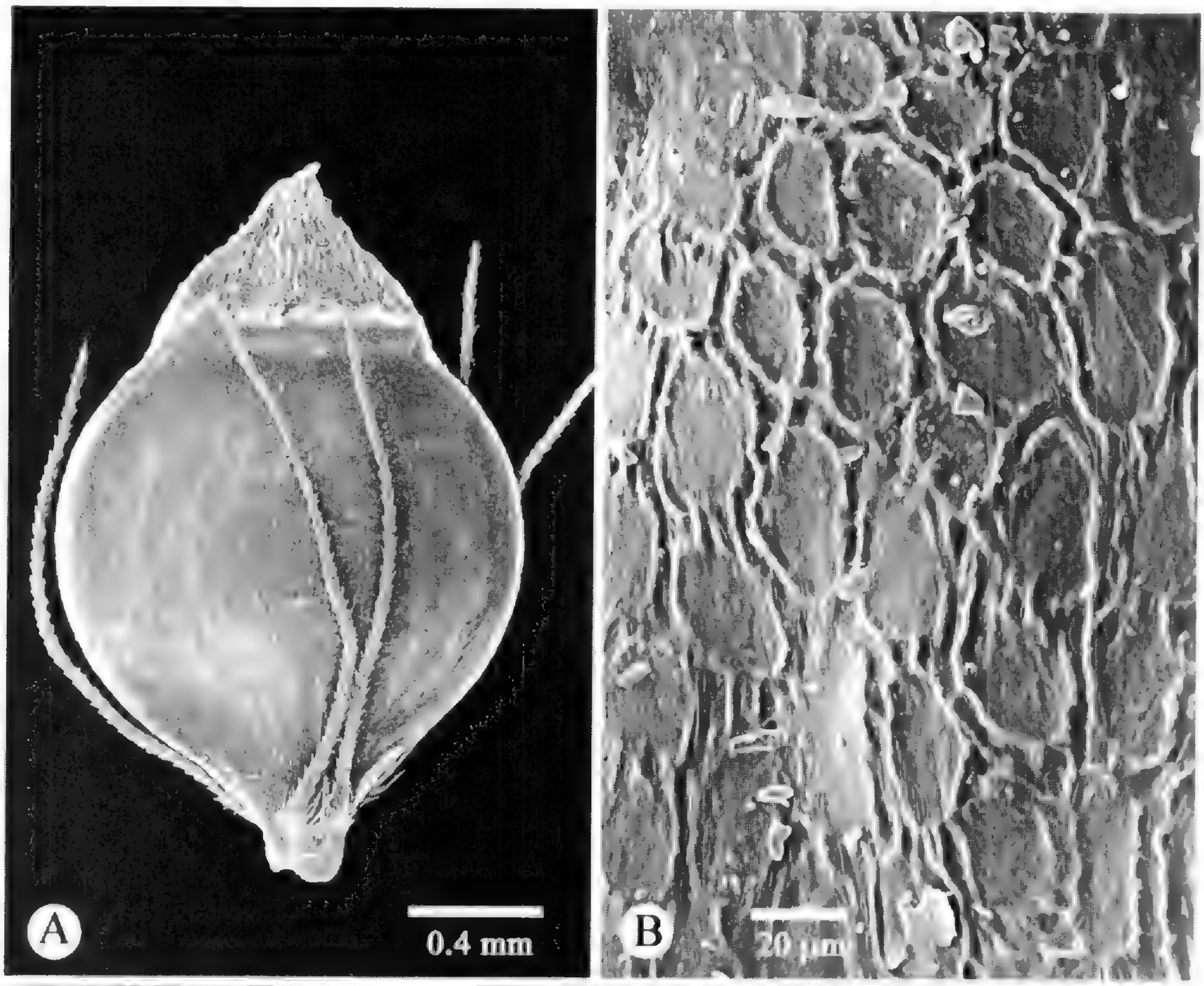


Fig. 67. A-B. *Rhynchospora rugosa*. A. achene. B. detail of pericarp. C-D. *Rhynchospora harperi*. C. achene. D. detail of pericarp. (A-B, from *Horn 11063*, US; C-D, from *Cooper 443*, U).



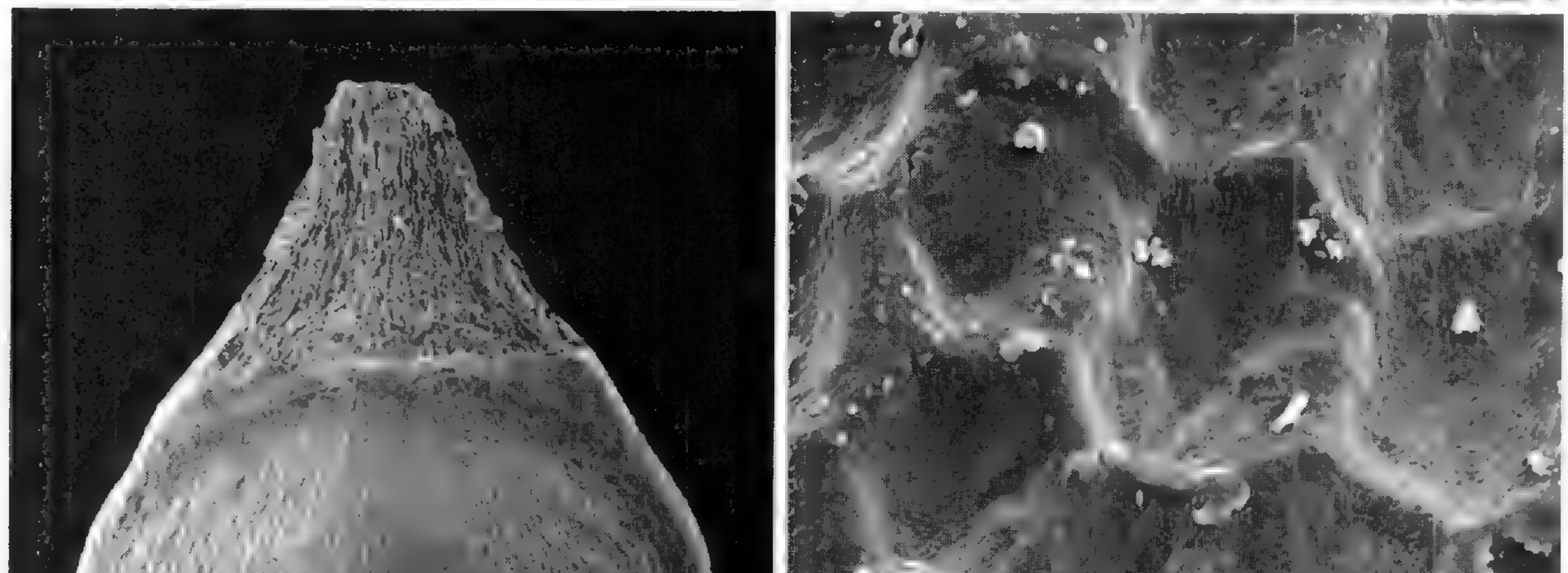


Fig. 68. A-B. *Rhynchospora fascicularis* subsp. *fascicularis*. A. achene. B. detail of pericarp. C-D. *Rhynchospora brachychaeta*. C. achene. D. detail of pericarp. (A-B, from *Stahel 145*, U; C-D, from *Clarke 923*, US).

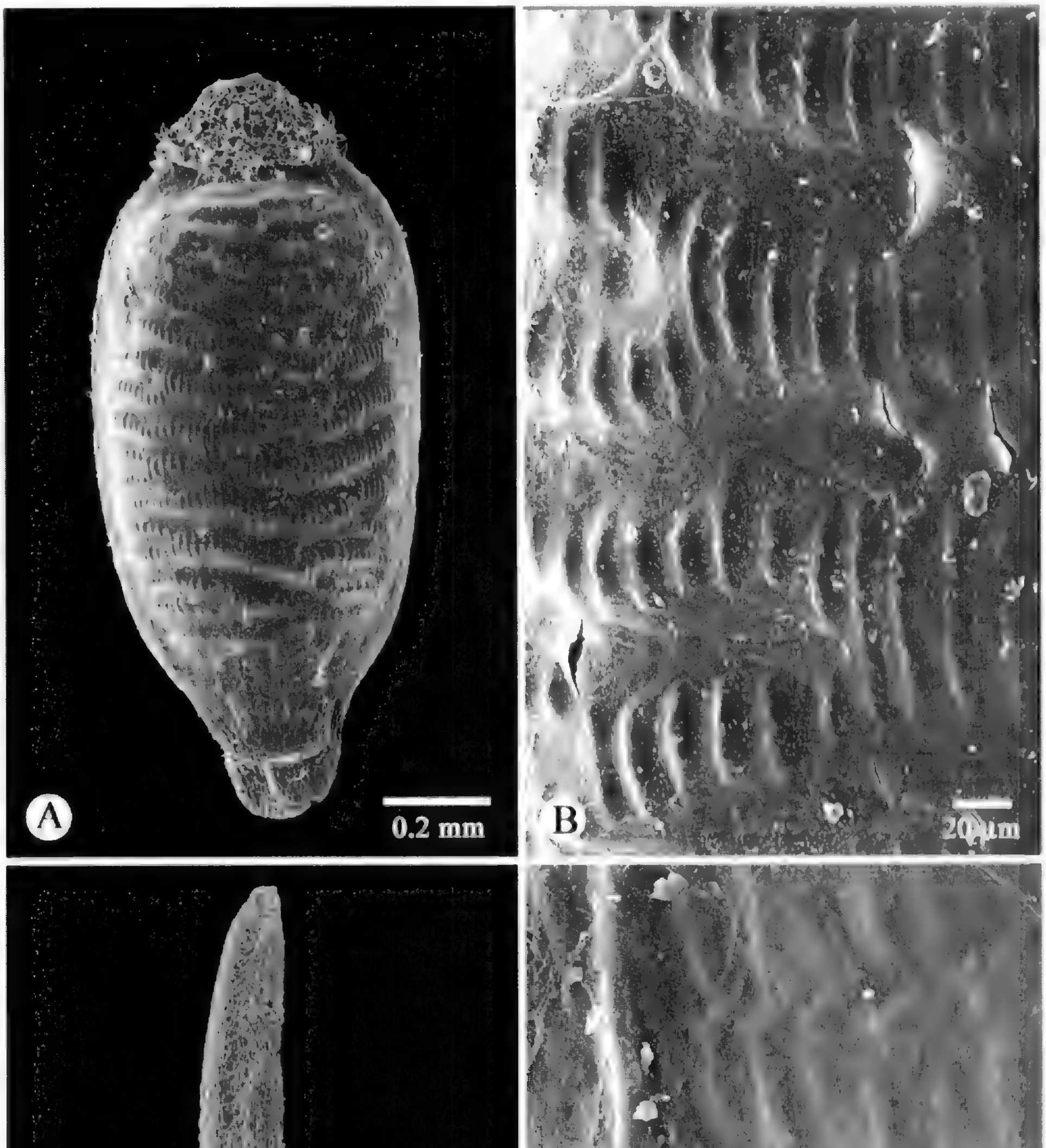


Fig. 69. A-B. *Rhynchospora tepuiana*. A. achene. B. detail of pericarp. C-D. *Rhynchospora splendens*. C. achene. D. detail of pericarp. (A-B, from *Thurn 253*, BM; C-D, from *L.B. Smith 6211*, US).

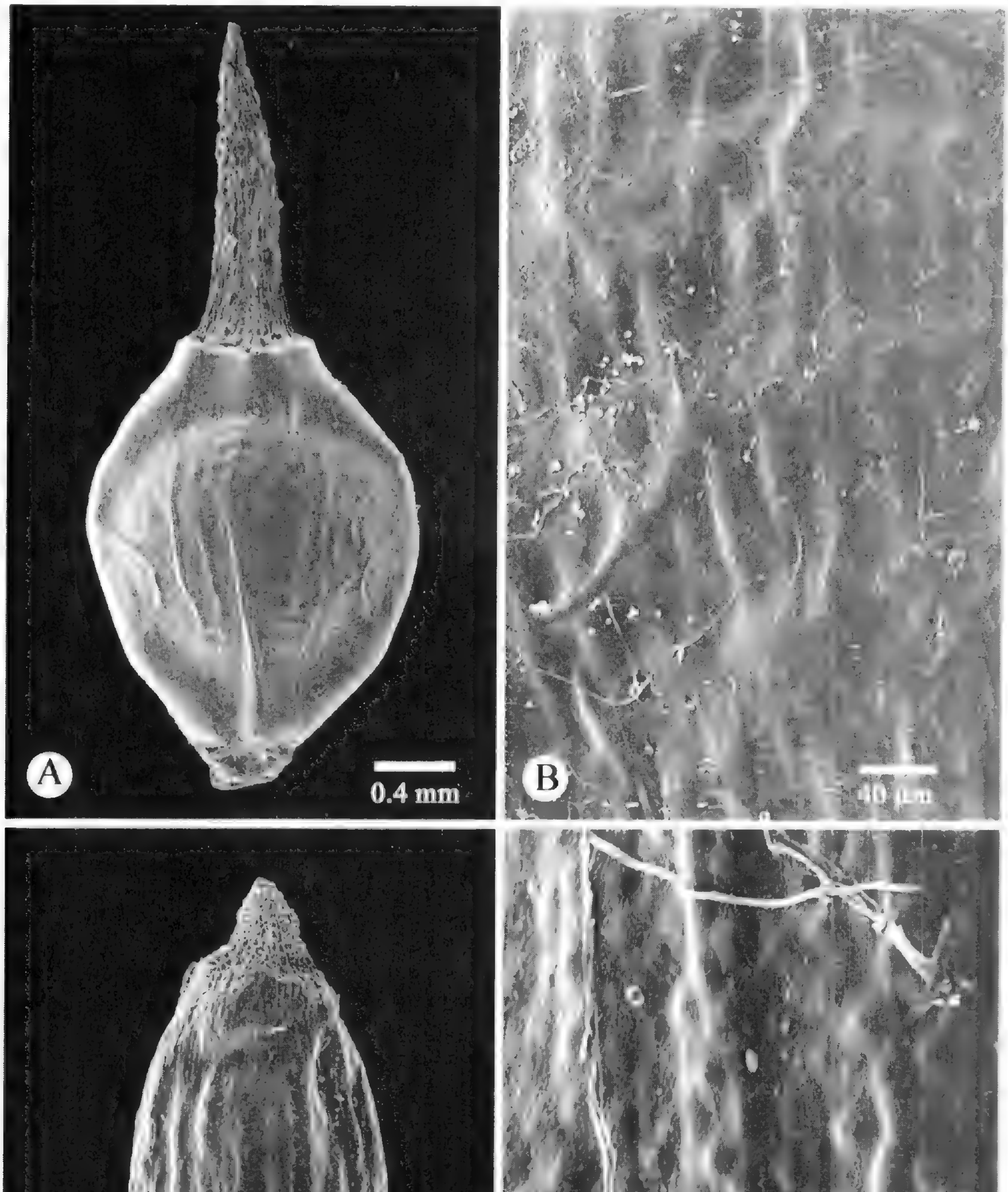


Fig. 70. A-B. *Rhynchospora exaltata*. A. achene. B. detail of pericarp. C-D. *Rhynchospora schomburgkiana*. C. achene. D. detail of pericarp. (A, from *Harris K19;* B, from *Appun 1179*, K; C-D, from *Pipoly 11308*, US).

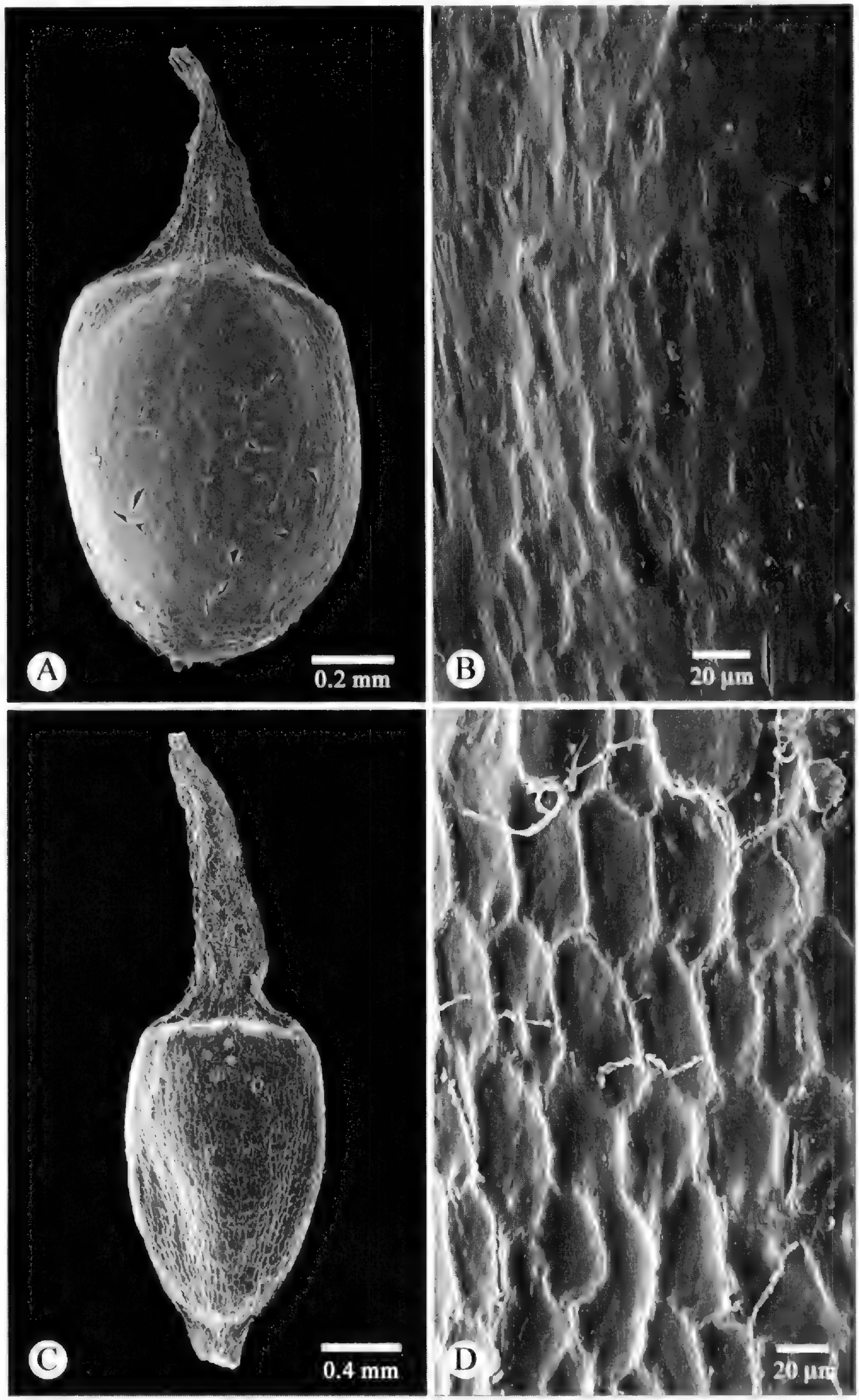


Fig. 71. A-B. *Rhynchospora capillifolia*. A. achene. B. detail of pericarp. C-D. *Rhynchospora longibracteata*. C. achene. D. detail of pericarp. (A-B, from *Renz 14269*, U; C-D, from *Little 16923*, US).

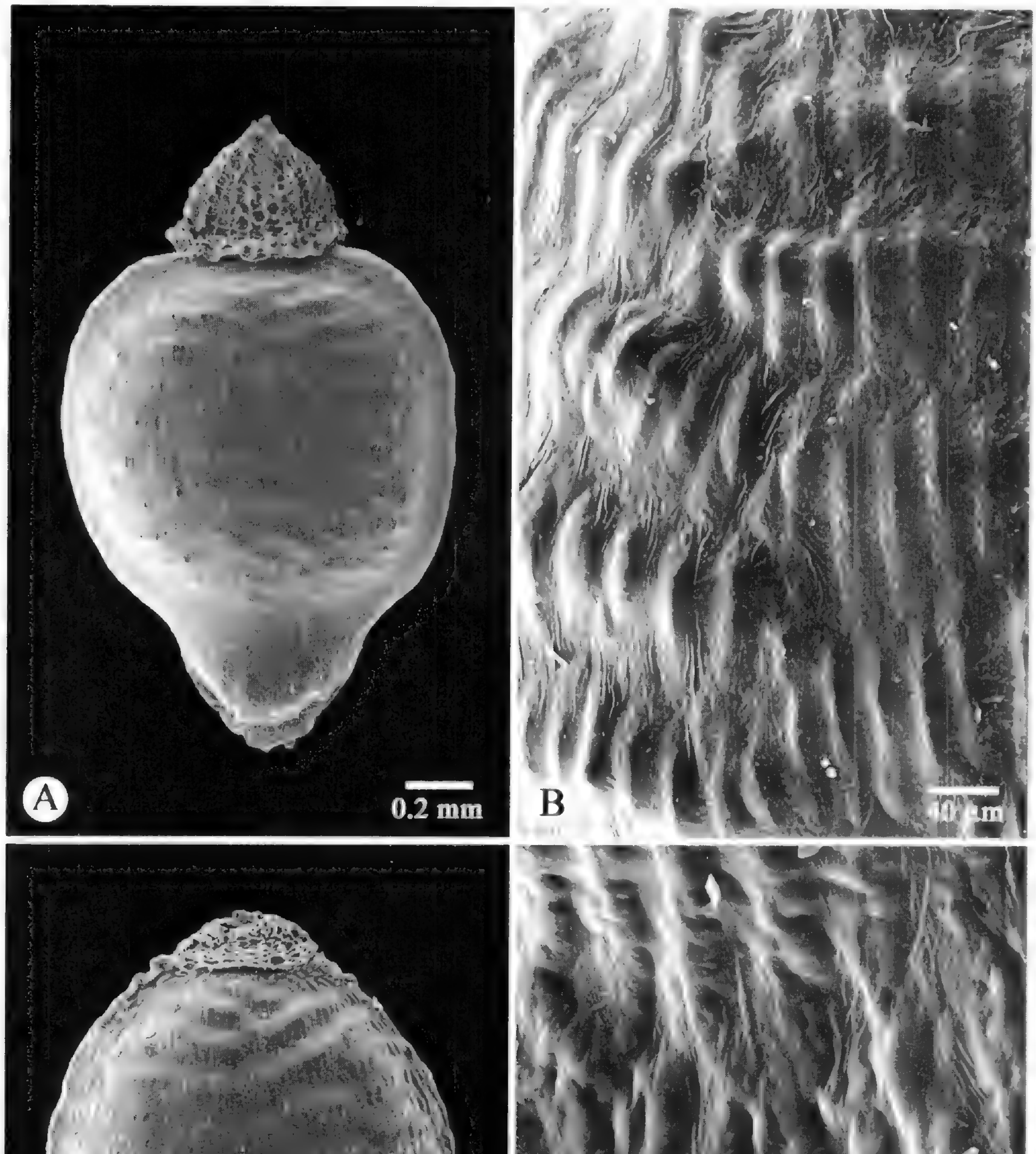
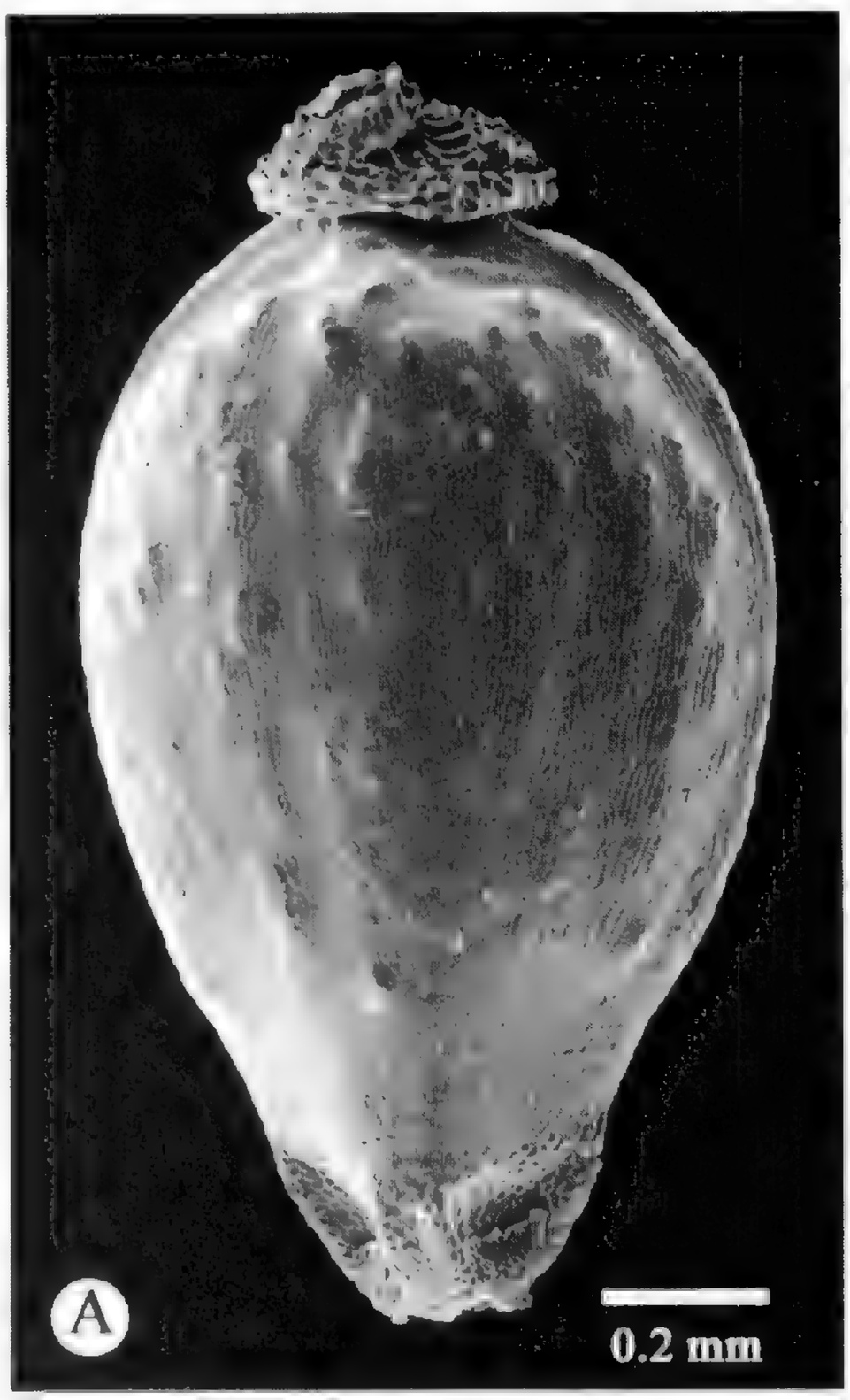


Fig. 72. A-B. *Rhynchospora arenicola*. A. achene. B. detail of pericarp. C-D. *Rhynchospora pilosa*. C. achene. D. detail of pericarp. (A-B, from *Lindeman 4346*, US; C-D, from *Sellow s.n.*, K).



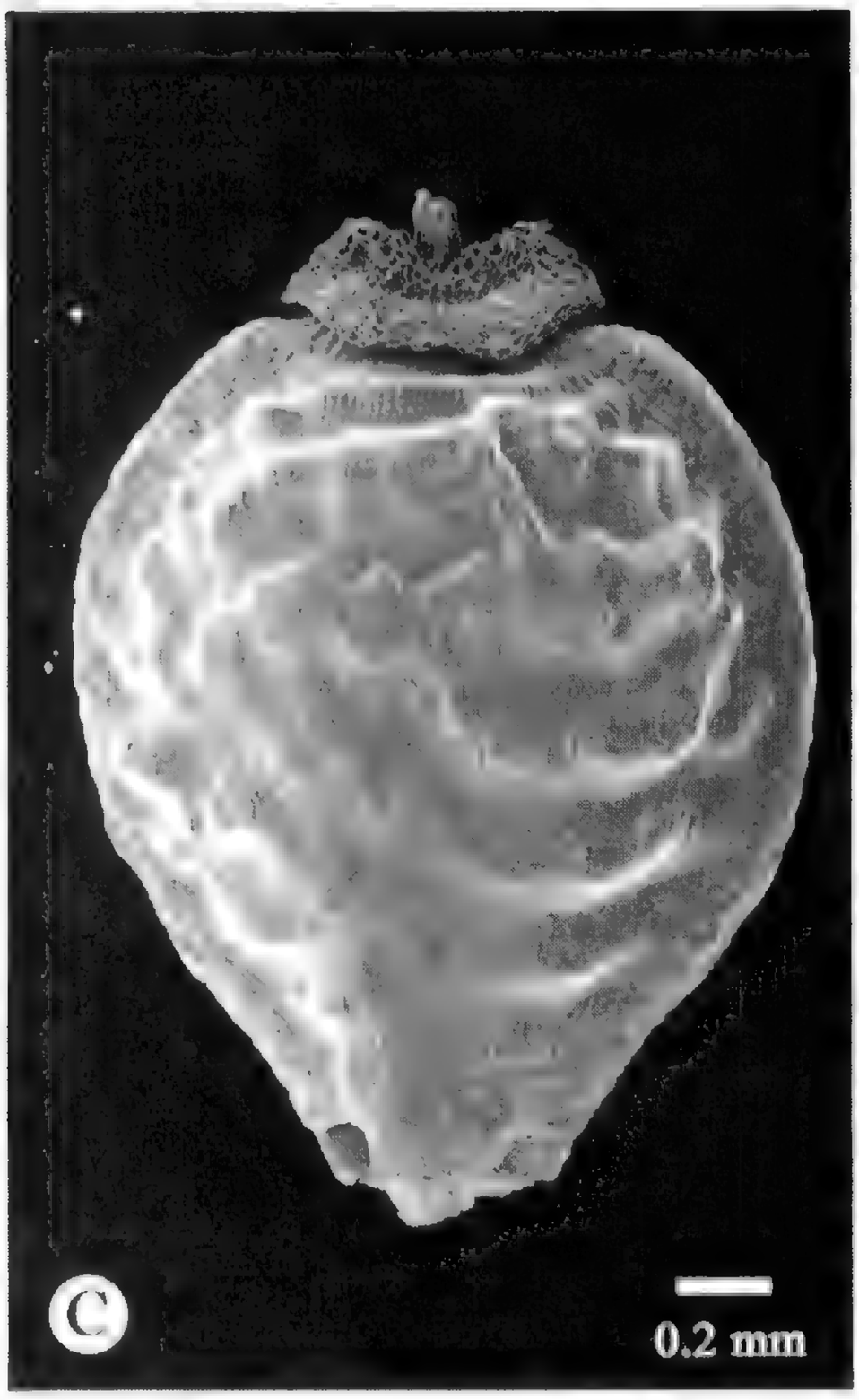
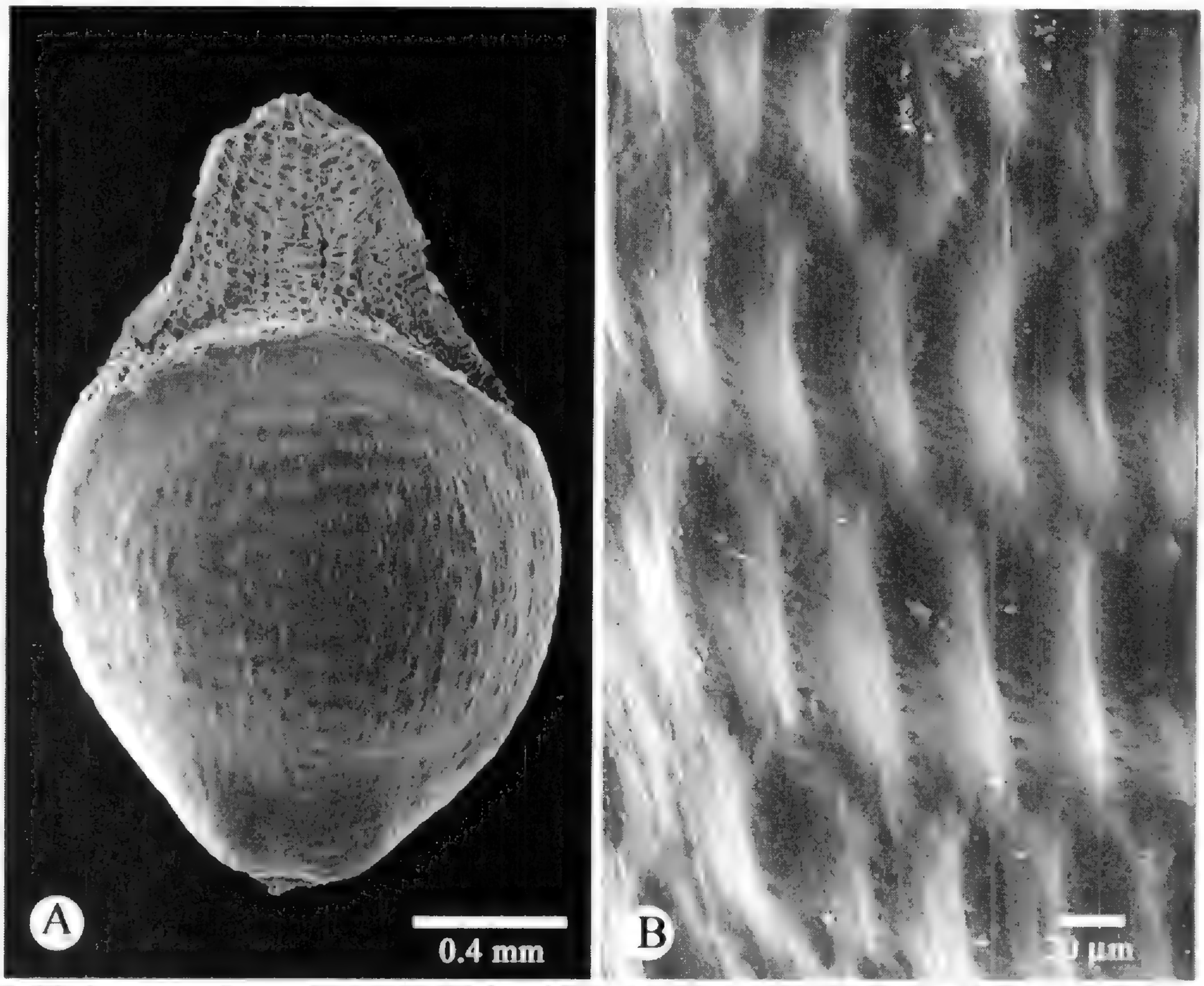


Fig. 73. A-B. *Rhynchospora maguireana*. A. achene. B. detail of pericarp. C-D. *Rhynchospora subdicephala*. C. achene. D. detail of pericarp. (A-B, from *Henkel et al. 4555*, US; C-D, from *deGranville 11747*, US).



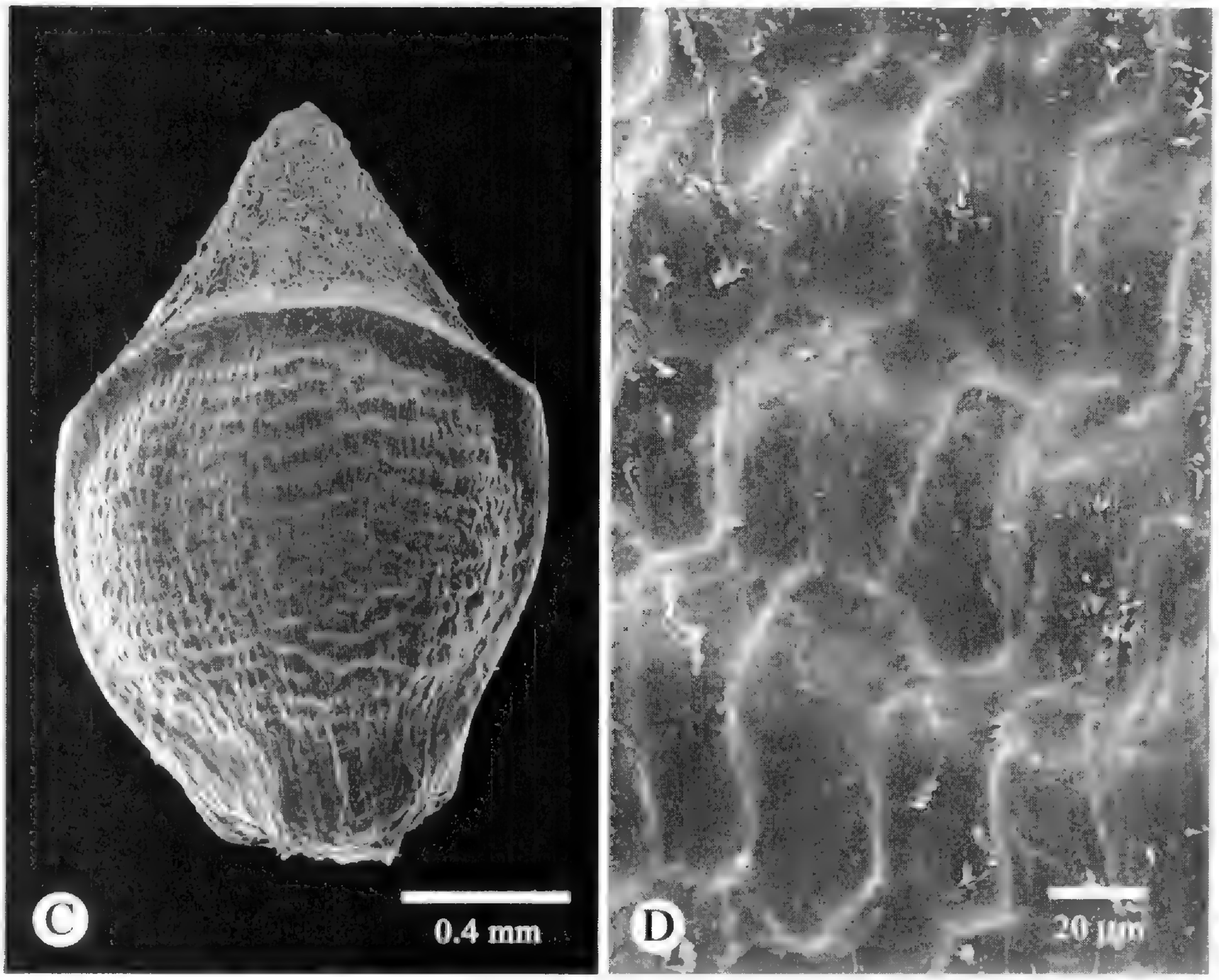


Fig. 74. A-B. *Rhynchospora nervosa.* A. achene. B. detail of pericarp. C-D. *Rhynchospora ciliata.* C. achene. D. detail of pericarp. (A-B, from *Gillespie 2487*, US; C-D, from *Broadway 66*, US).

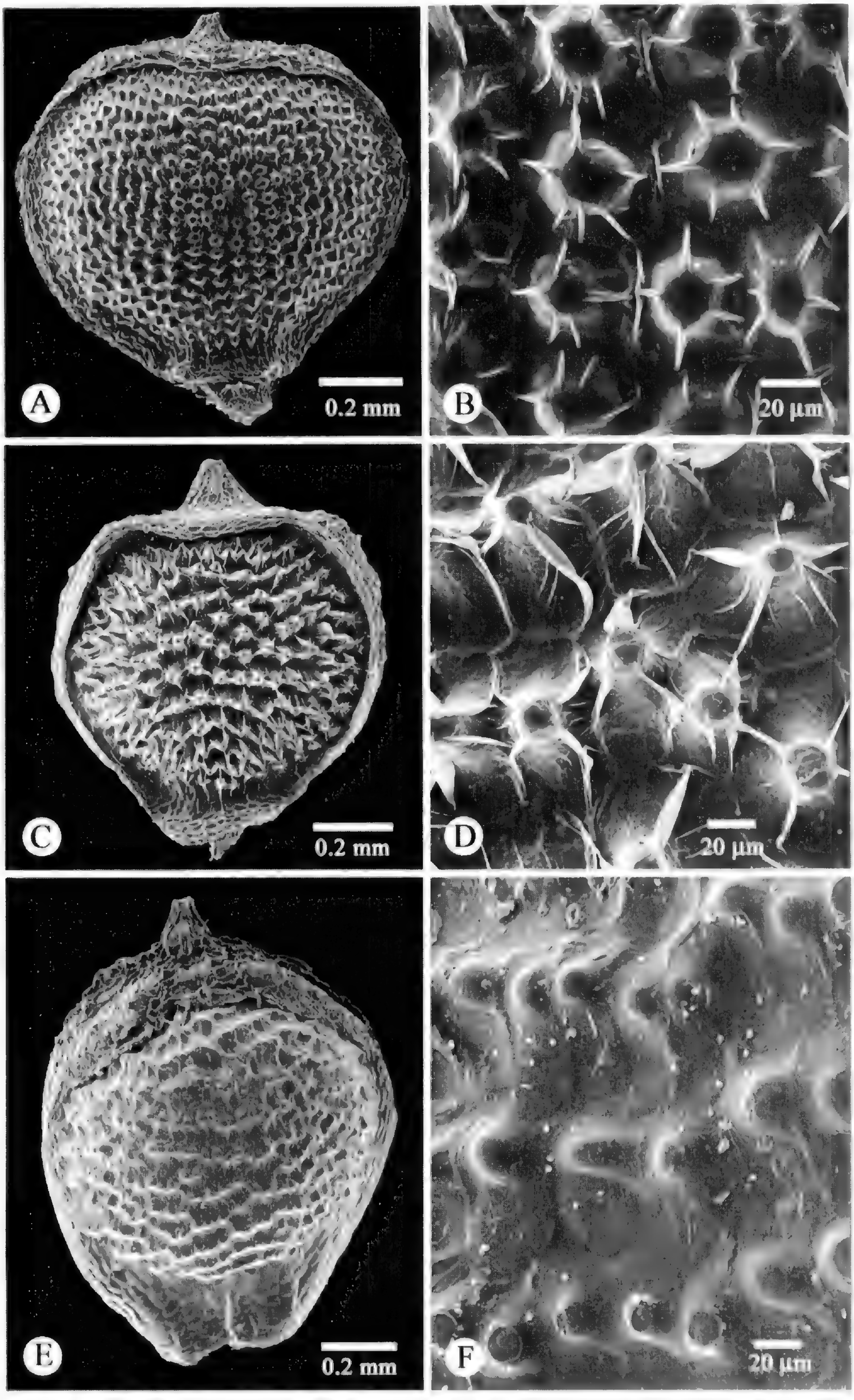


Fig. 75. A-B. *Rhynchospora reptans*. A. achene. B. detail of pericarp. C-D. *Rhynchospora papillosa*. C. achene. D. detail of pericarp. E-F. *Rhynchospora montana*. E. achene. F. detail of pericarp. (A-B, from *Moretti 608*, CAY; C-D, from *Horn 11071*, US; E-F, from *Lindeman et al. 69*, U).

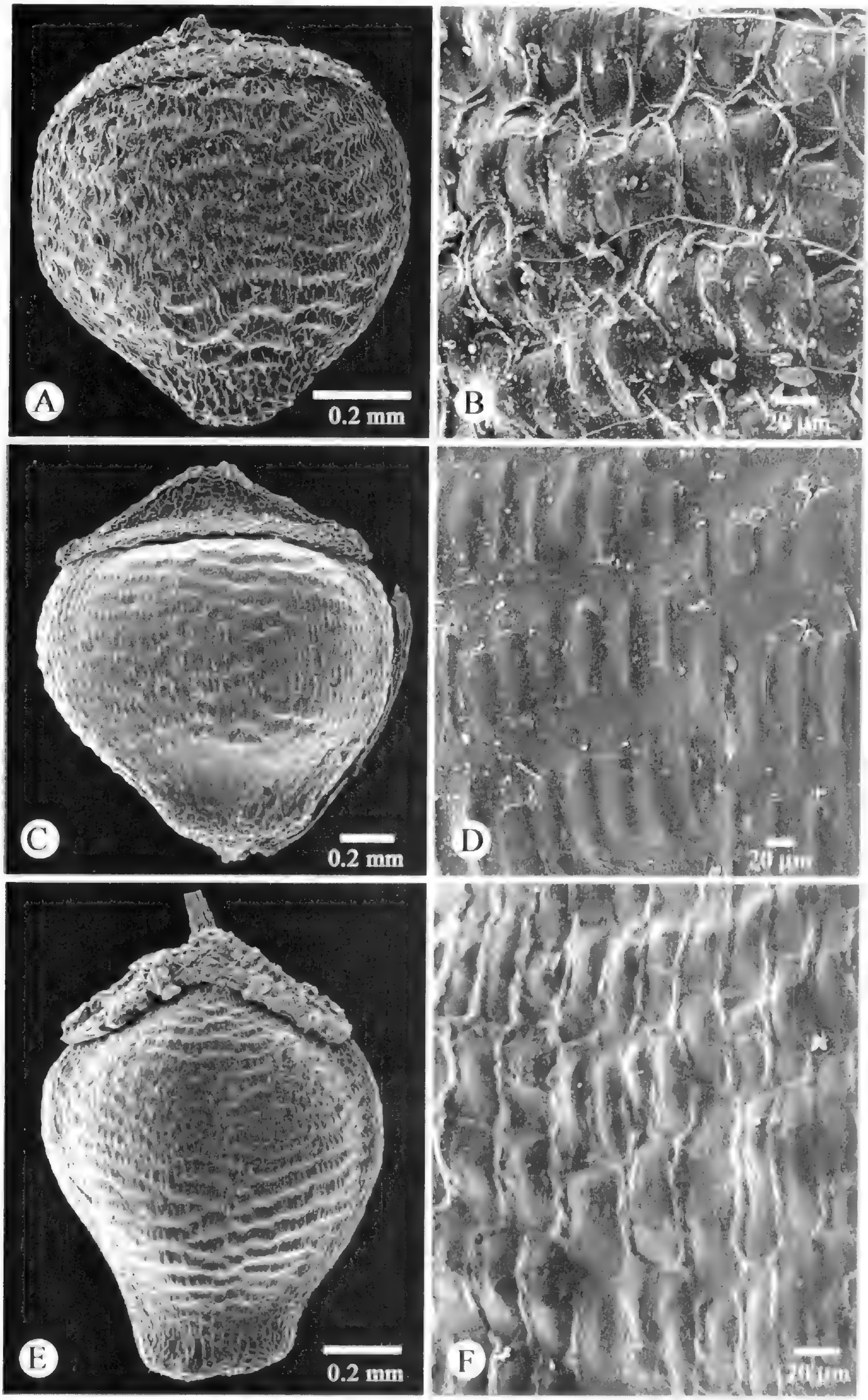


Fig. 76. A-B. *Rhynchospora albescens*. A. achene. B. detail of pericarp. C-D. *Rhynchospora watsonii*. C. achene. D. detail of pericarp. E-F. *Rhynchospora steyermarkii*. E. achene. F. detail of pericarp. (A-B, from *A.C. Smith 2288*, US; C-D, from *deGranville 6367*, US; E-F, from *Henkel 5550*, US).

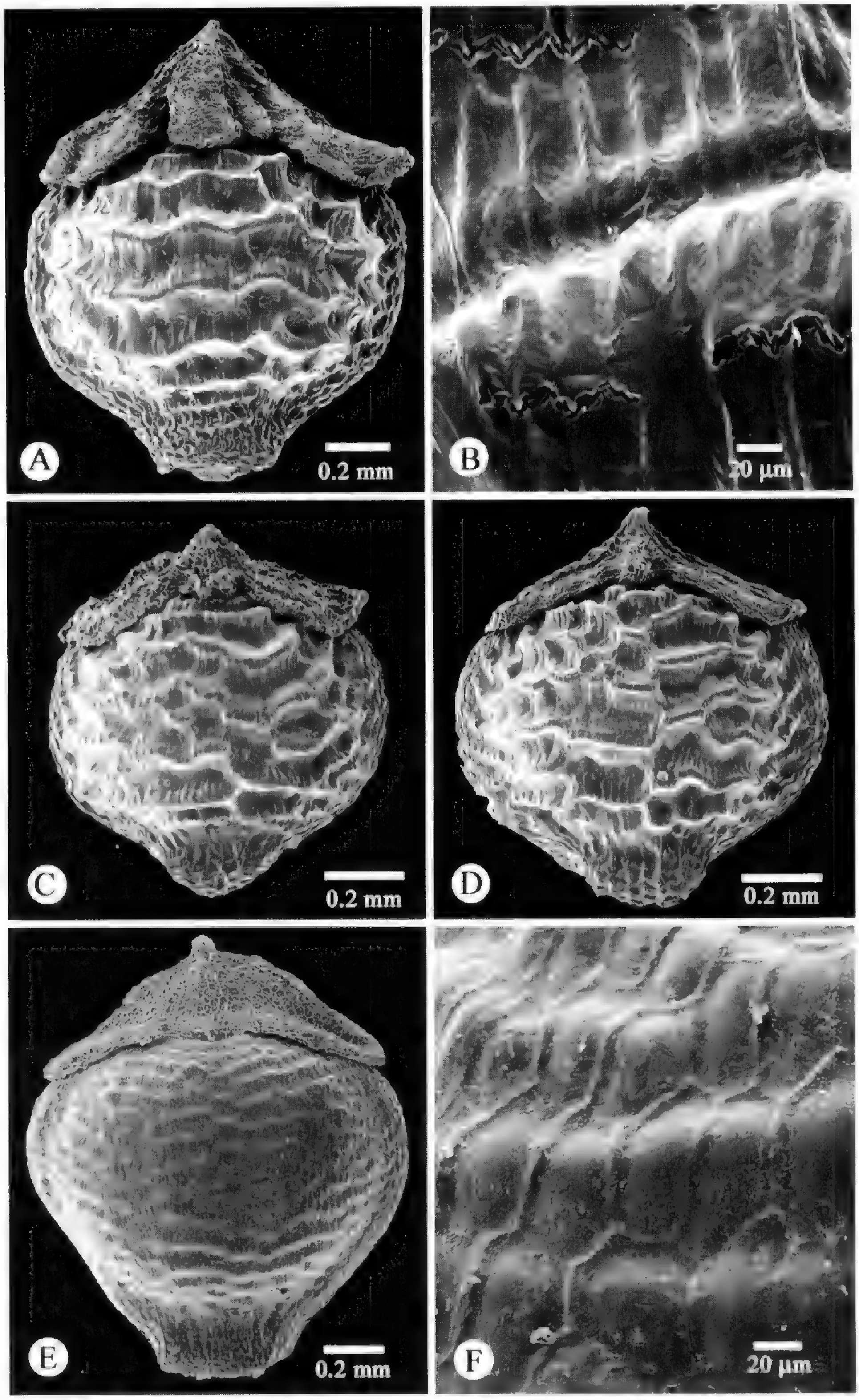


Fig. 77. A-B. *Rhynchospora pubera* subsp. *pubera*. A. achene. B. detail of pericarp. C-D. *Rhynchospora pubera* subsp. *parvula*. C. achene. D. achene. E-F. *Rhynchospora radicans* subsp. *microcephala*. E. achene. F. detail of pericarp. (A-B, from *Acevedo 6015*, US; C-D, from *Pennell 1434*, US; E-F, from *De La Cruz 2151*, MO).

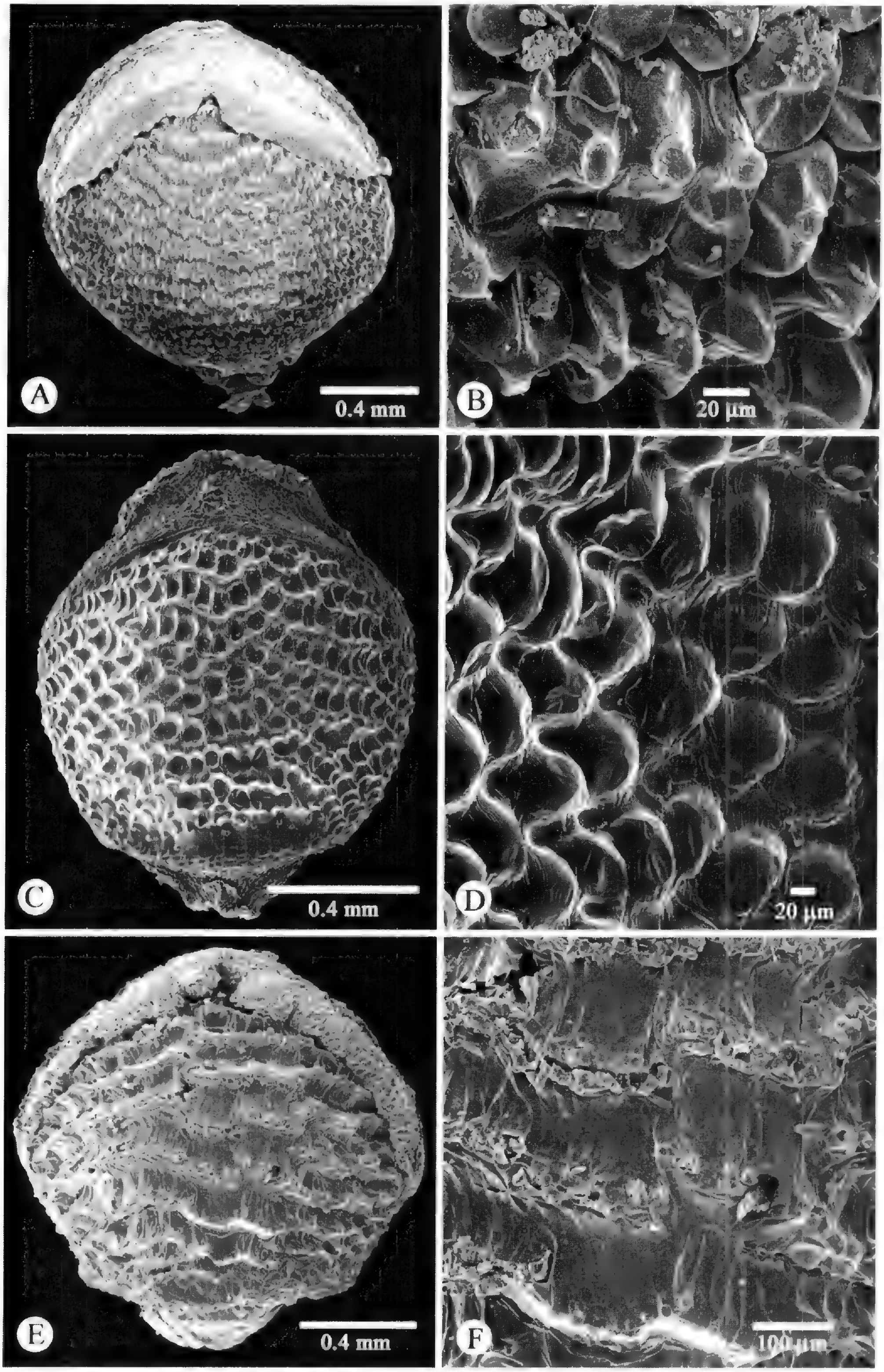
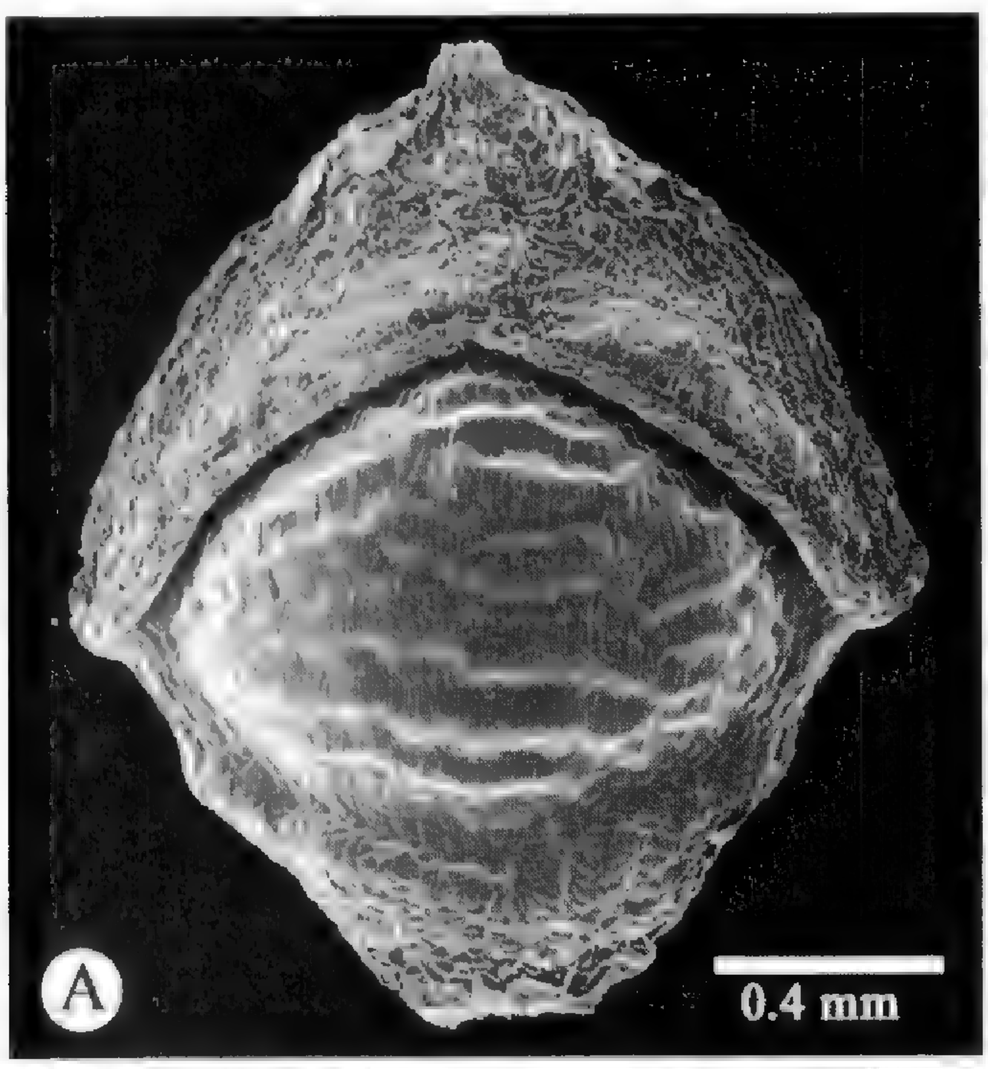
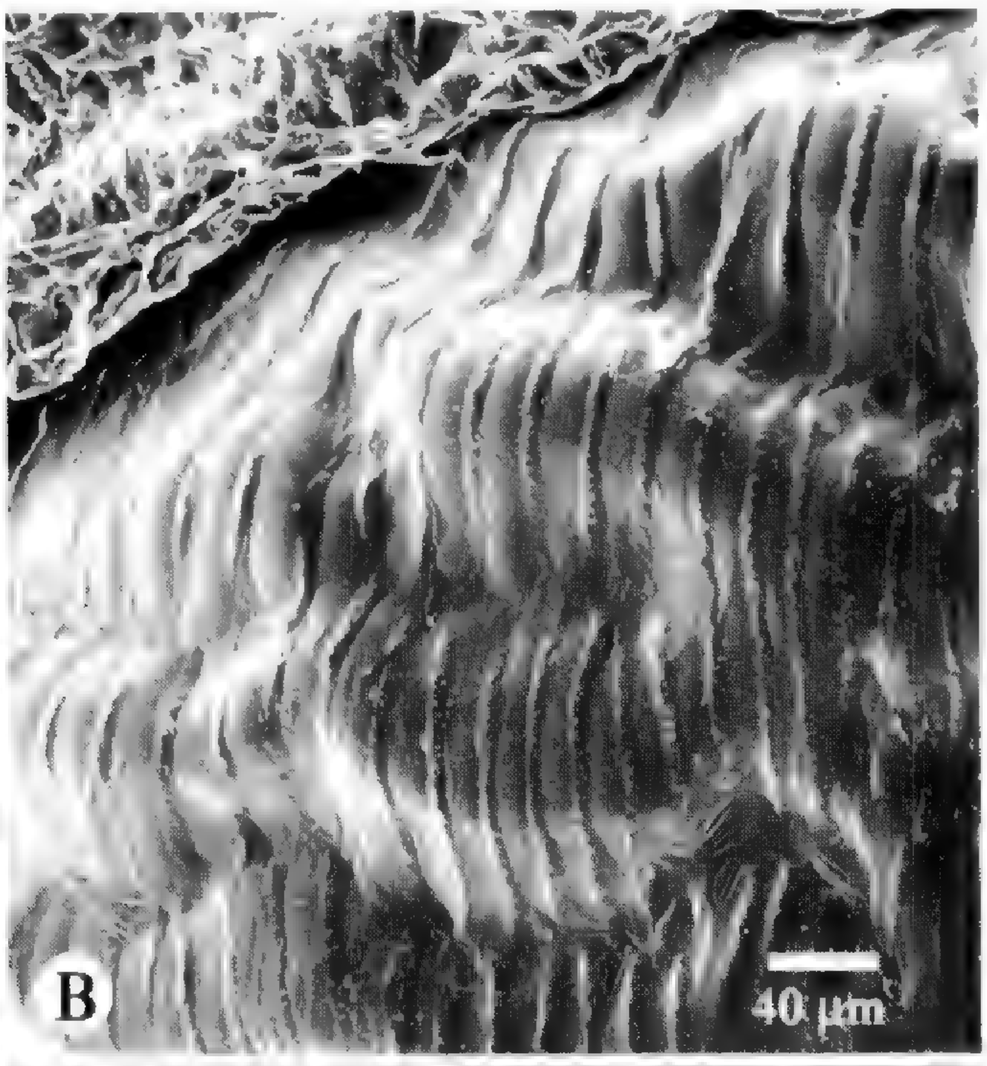
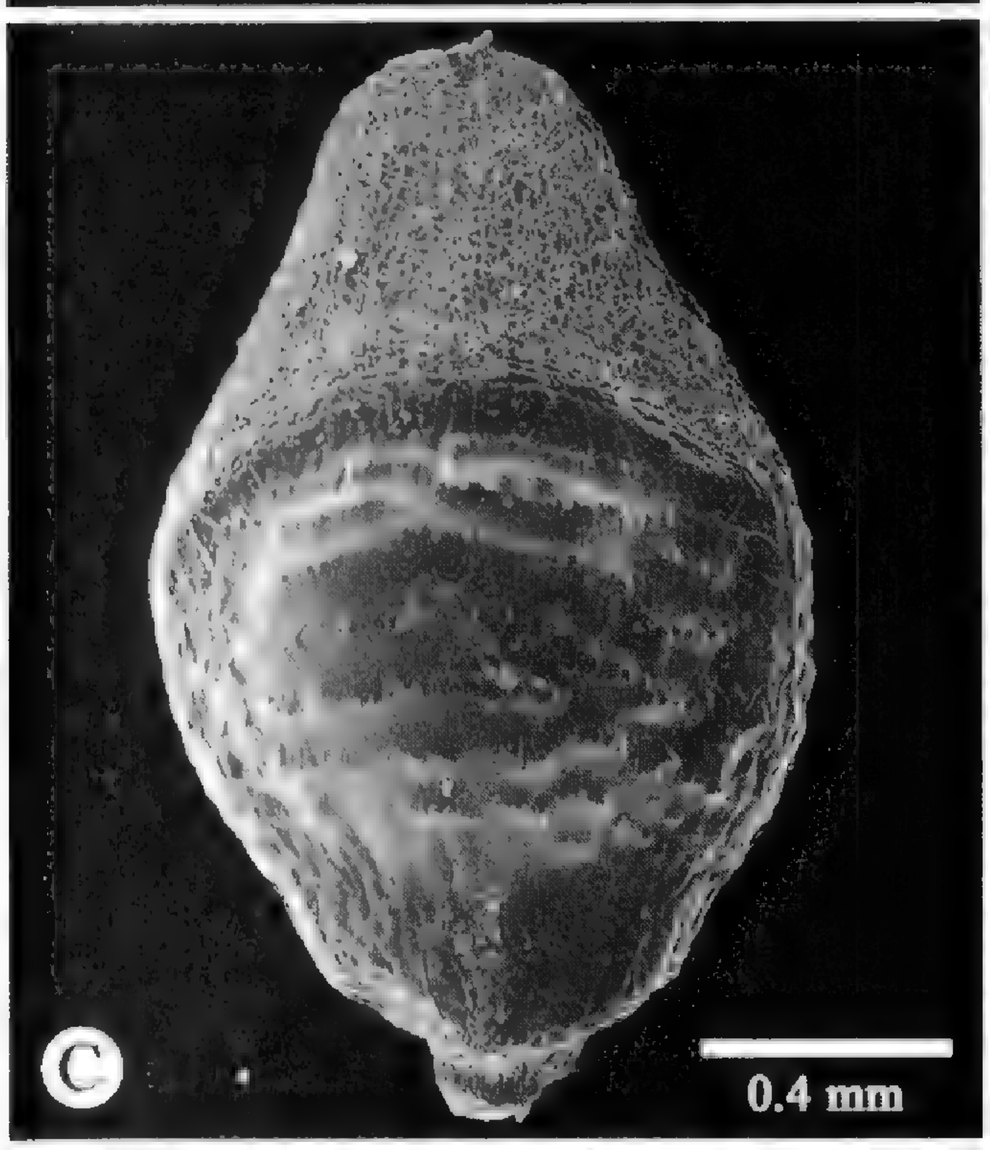
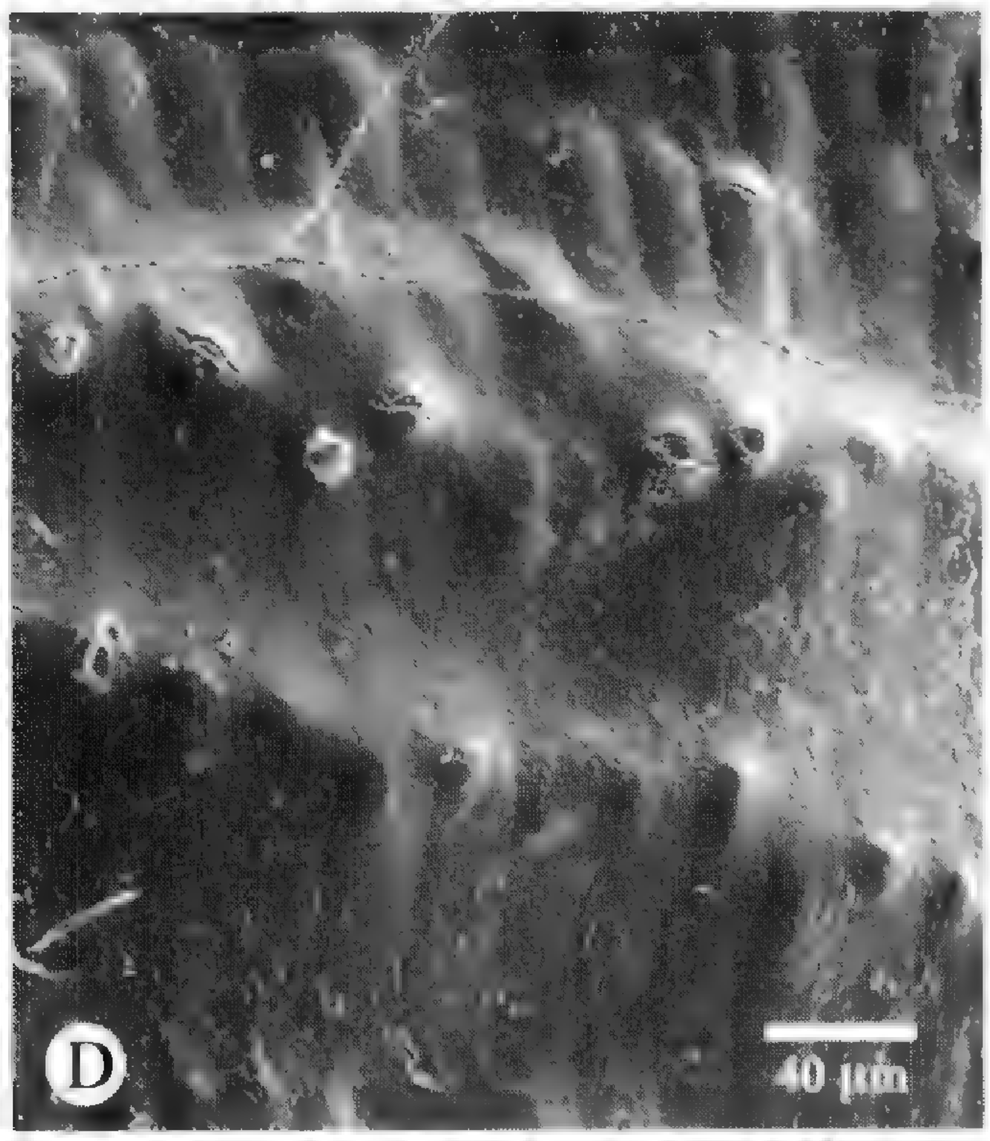


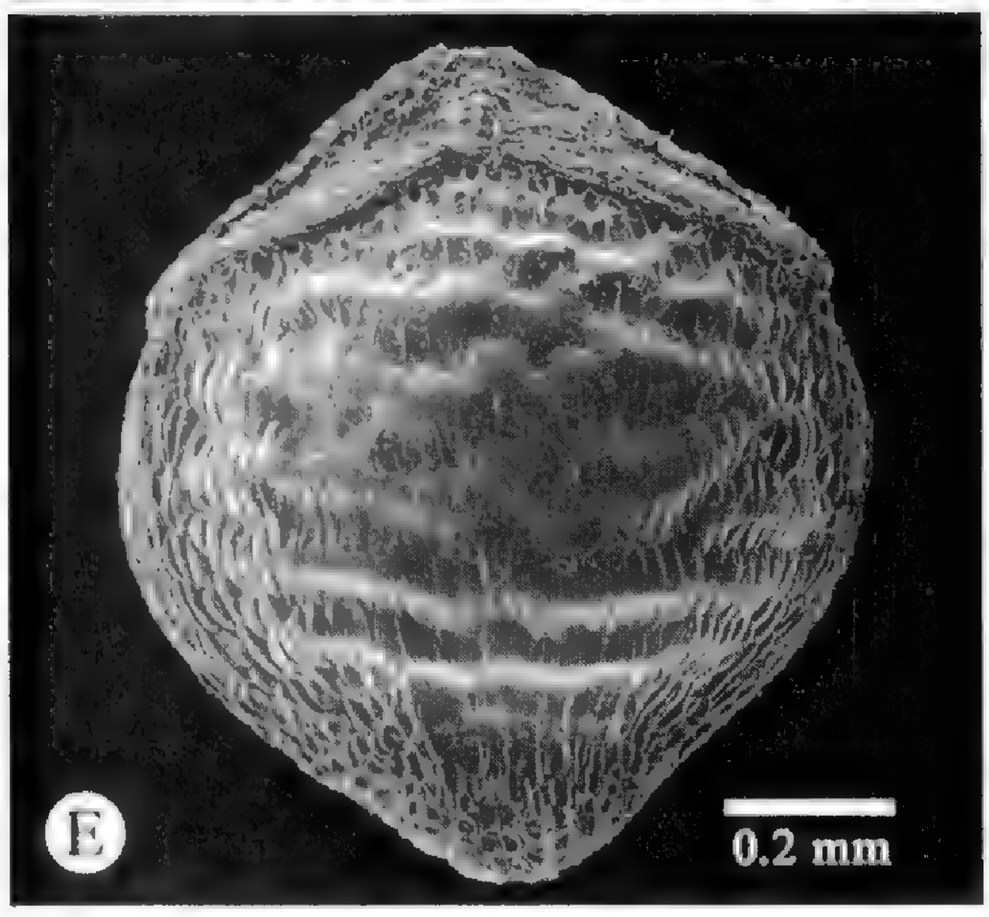
Fig. 78. A-B. *Rhynchospora cajennensis*. A. achene. B. detail of pericarp. C-D. *Rhynchospora sublanata*. C. achene. D. detail of pericarp. E-F. *Rhynchospora divaricata*. E. achene. F. detail of pericarp. (A-B, from *Killeen et al. 5780*, NY; C-D, from *Jansen Jacobs 2556*, U; E-F, from *Lindeman et al. 483*, MO).











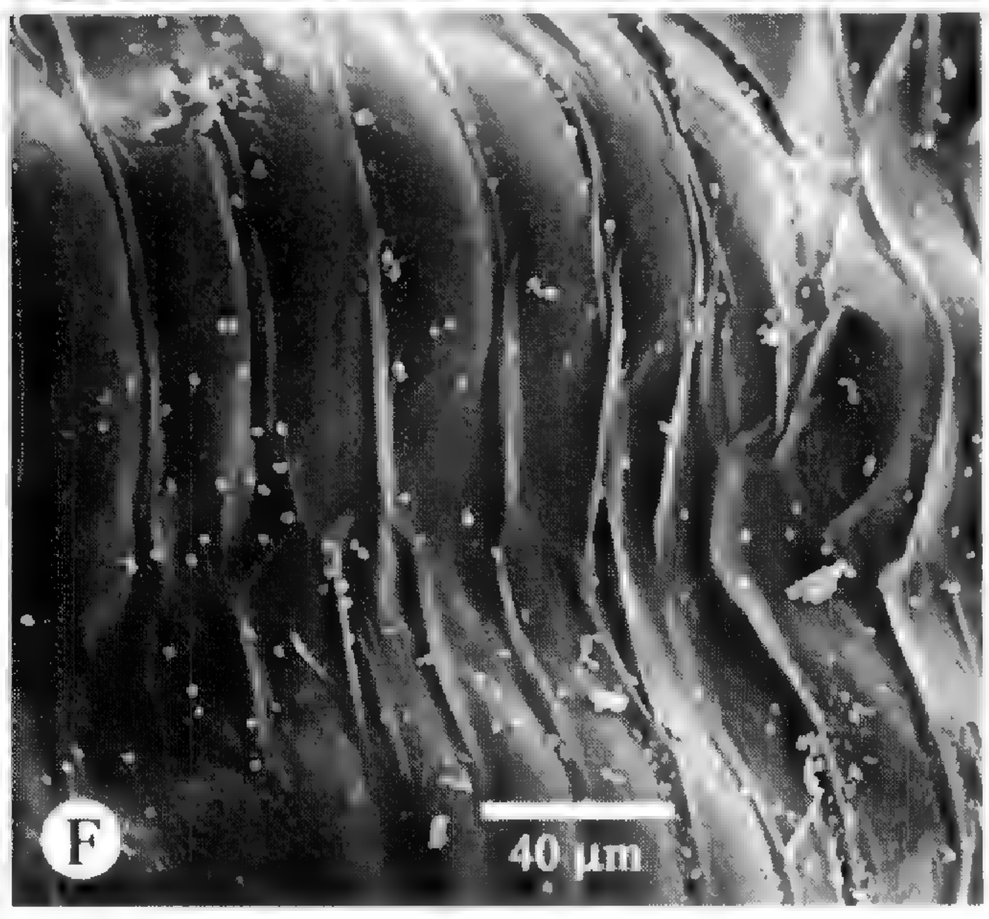


Fig. 79. A-B. *Rhynchospora candida*. A. achene. B. detail of pericarp. C-D. *Rhynchospora rupicola*. C. achene. D. detail of pericarp. E-F. *Rhynchospora nitens*. E. achene. F. detail of pericarp. (A-B, from *Oldenburger & Norde 671*, U; C-D, from *Daniëls & Jonker 998*, U; E-F, from *Graham 392*, K).

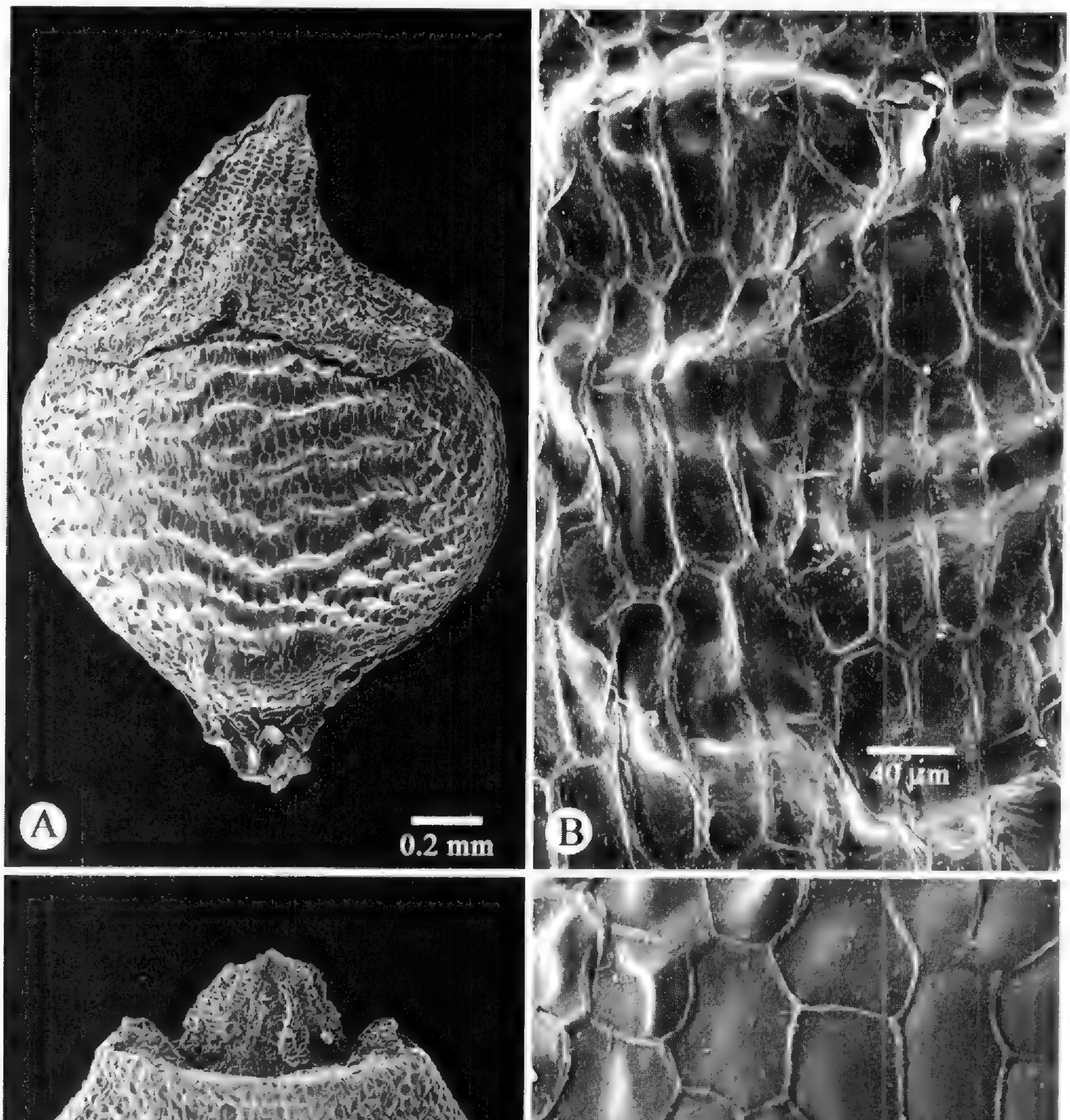


Fig. 80. A-B. *Rhynchospora velutina*. A. achene. B. detail of pericarp. C-D. *Rhynchospora filiformis*. C. achene. D. detail of pericarp. (A-B, from *Henkel 5674*, US; C-D, from *Cremers & Hoff 10700*, US).

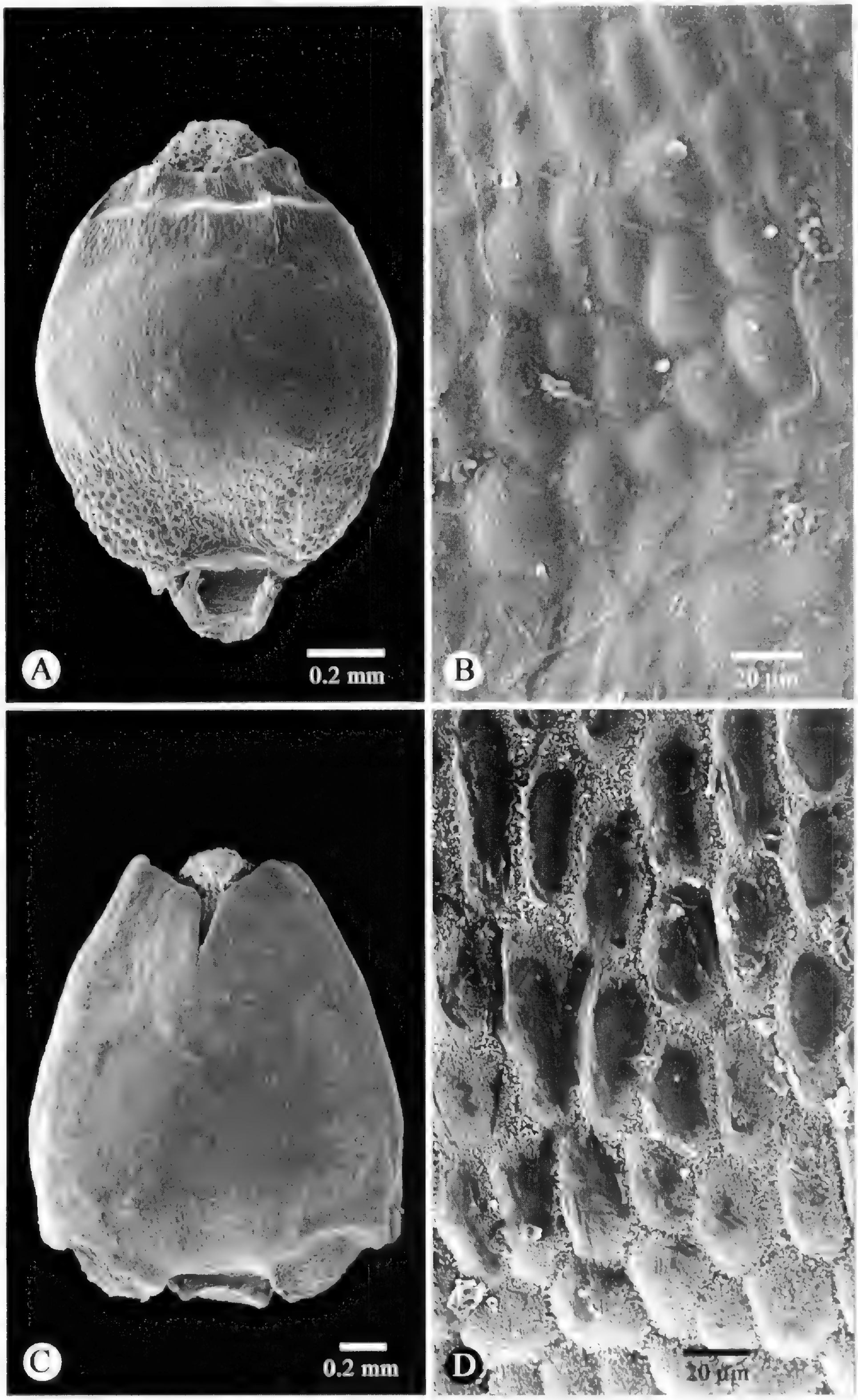


Fig. 81. A-B. *Rhynchospora brevirostris*. A. achene. B. detail of pericarp. C-D. *Rhynchospora donselaarii*. C. achene. D. detail of pericarp. (A-B, from *Oldenburger et al. 86*, U; C-D, from *van Donselaar 3618*, U).

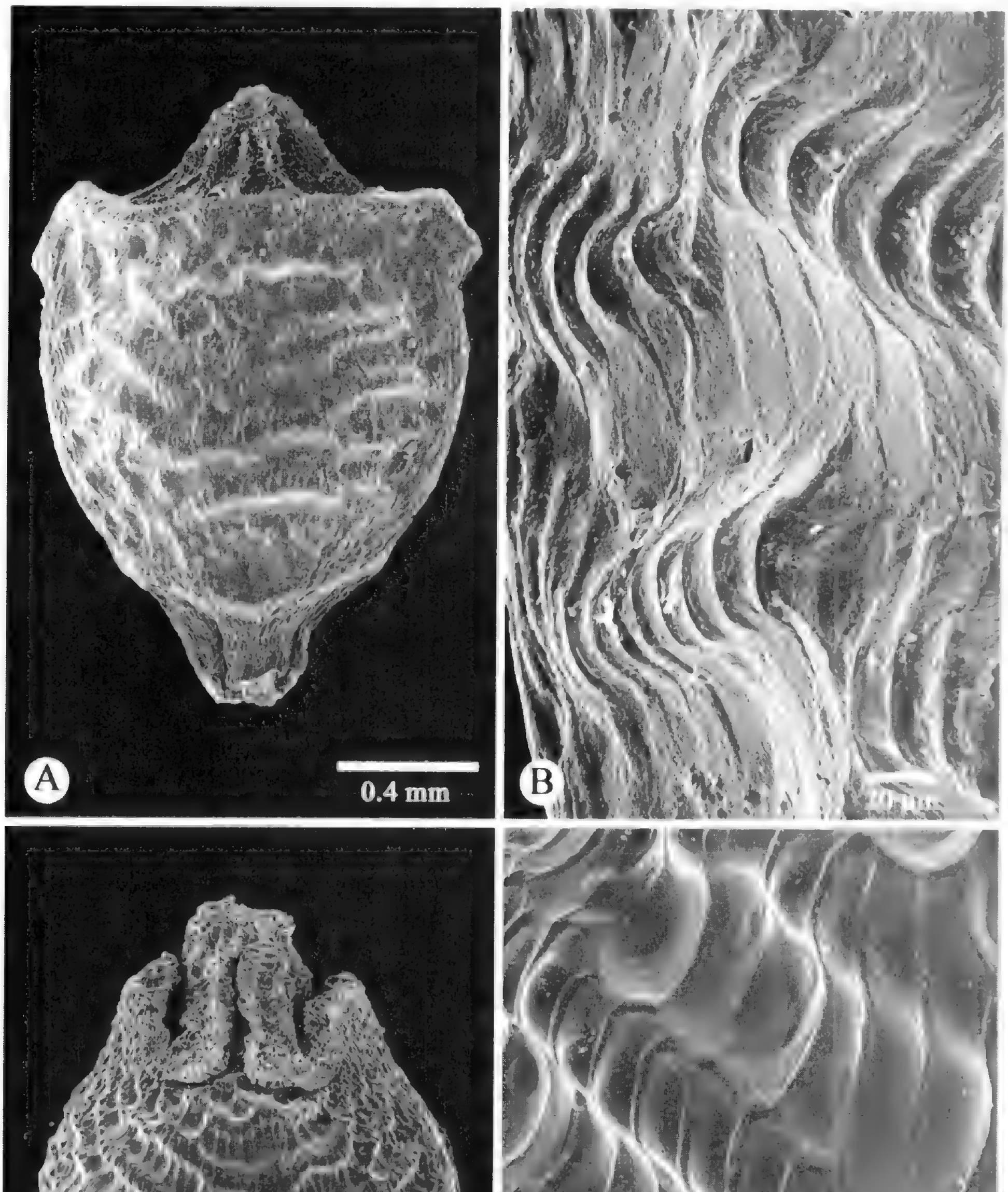
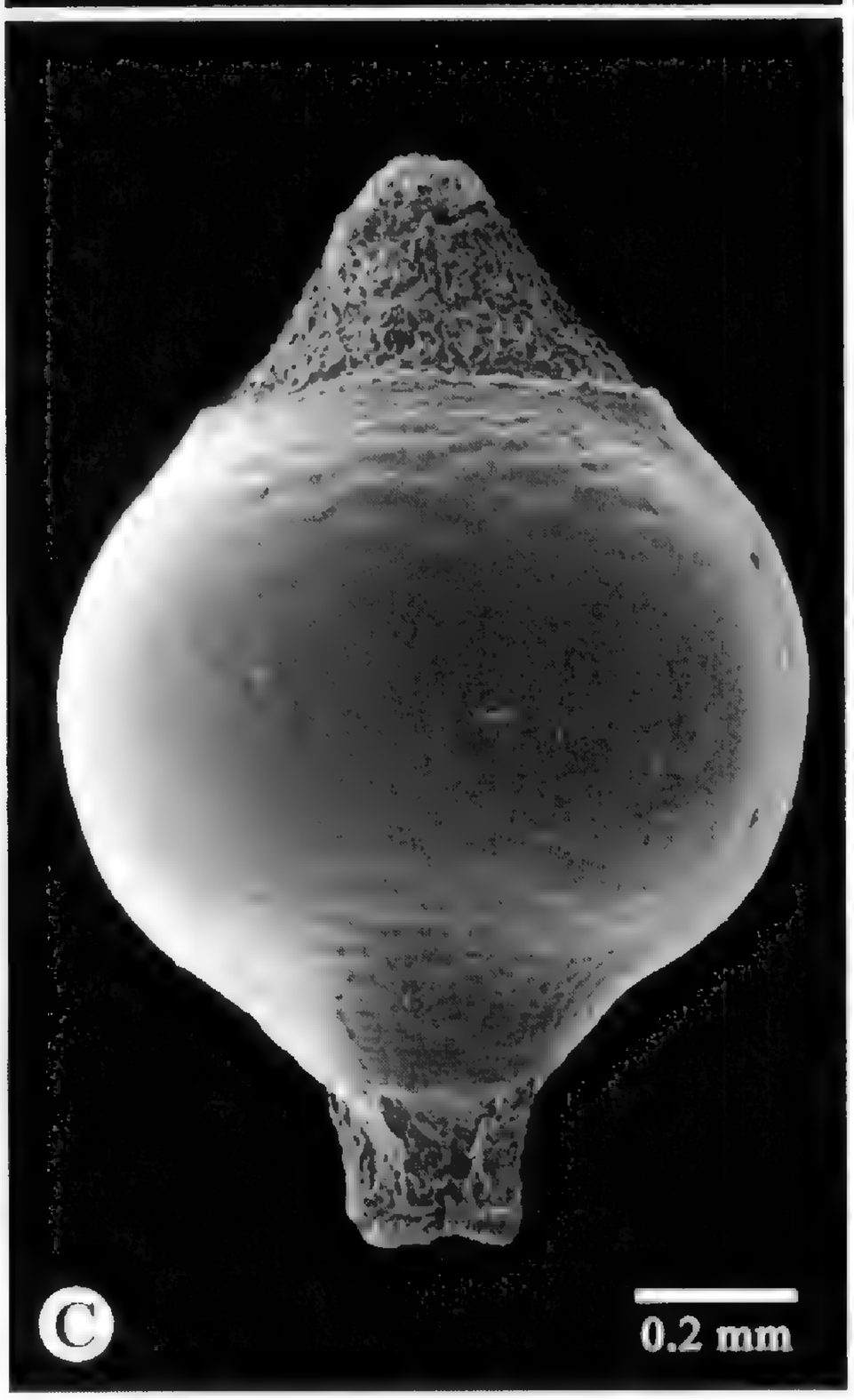


Fig. 82. A-B. *Rhynchospora fallax*. A. achene. B. detail of pericarp. C-D. *Rhynchospora tenerrima*. C. achene. D. detail of pericarp. (A-B, from *Pulle 270*, US; C-D, from *Oldenburger et al. 253*, U).



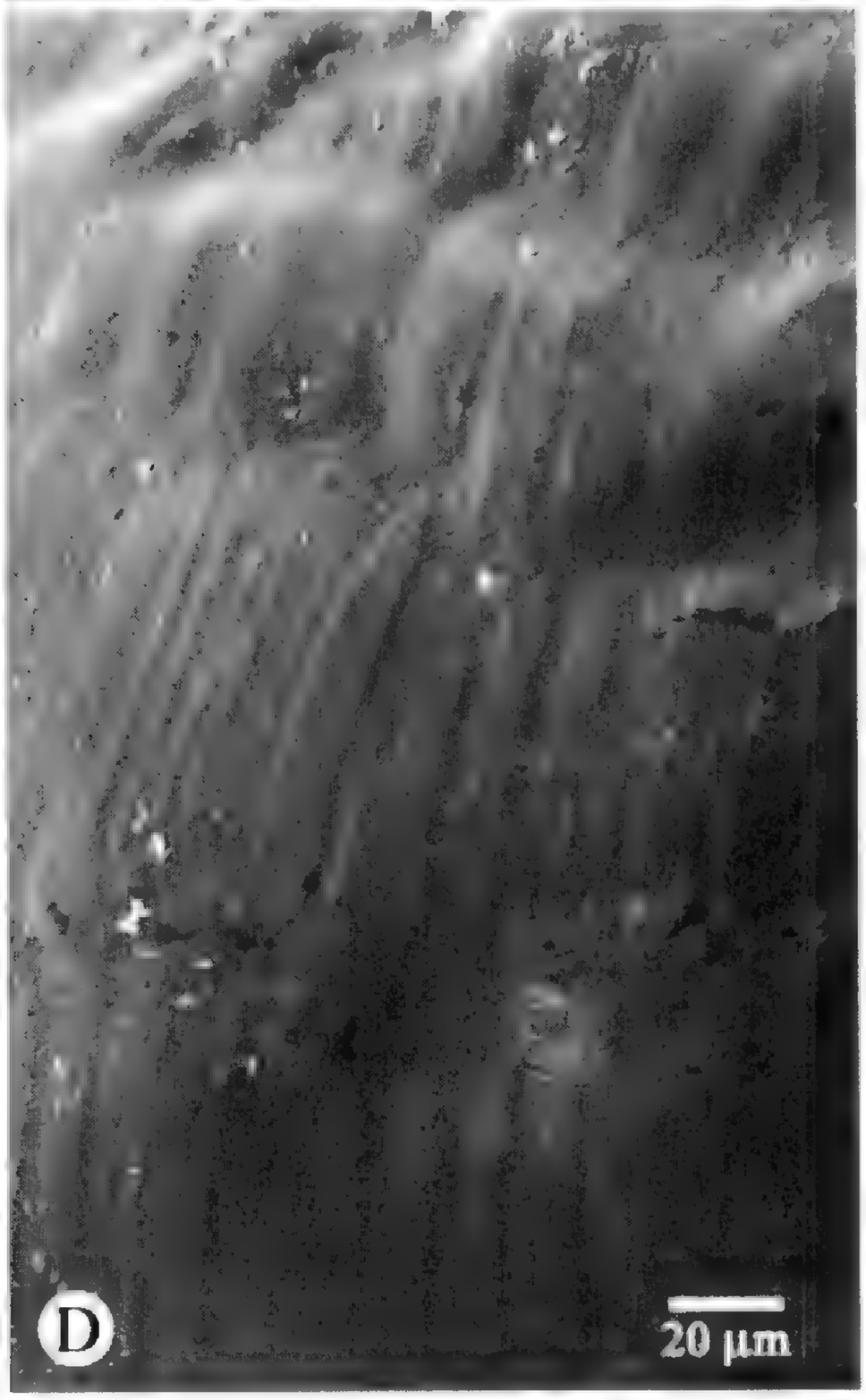


Fig. 83. A-B. *Rhynchospora roraimae*. A. achene. B. detail of pericarp. C-D. *Rhynchospora caracasana*. C. achene. D. detail of pericarp. (A-B, from *Henkel & Hoffman 115*, US; C-D, from *Teunissen & Wildschut 11783*, US).

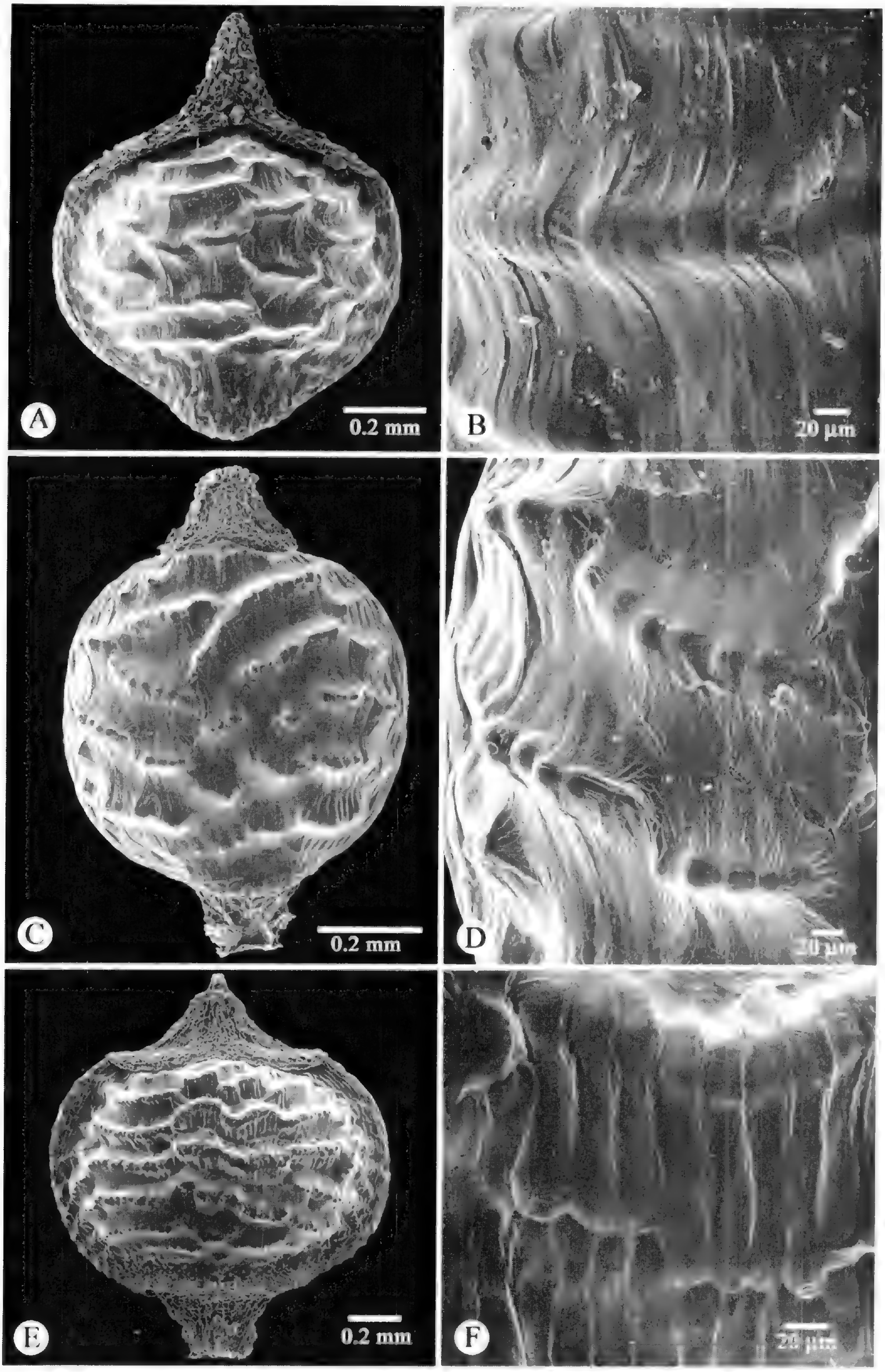


Fig. 84. A-B. *Rhynchospora contracta*. A. achene. B. detail of pericarp. C-D. *Rhynchospora juncíformis*. C. achene. D. detail of pericarp. E-F. *Rhynchospora emaciata*. E. achene. F. detail of pericarp. (A-B, from *Asplund 5481*, US; C-D, from *Maas & Westra 3684*, MO; E-F, from *Hatschbach & Koyama 24011*, US).

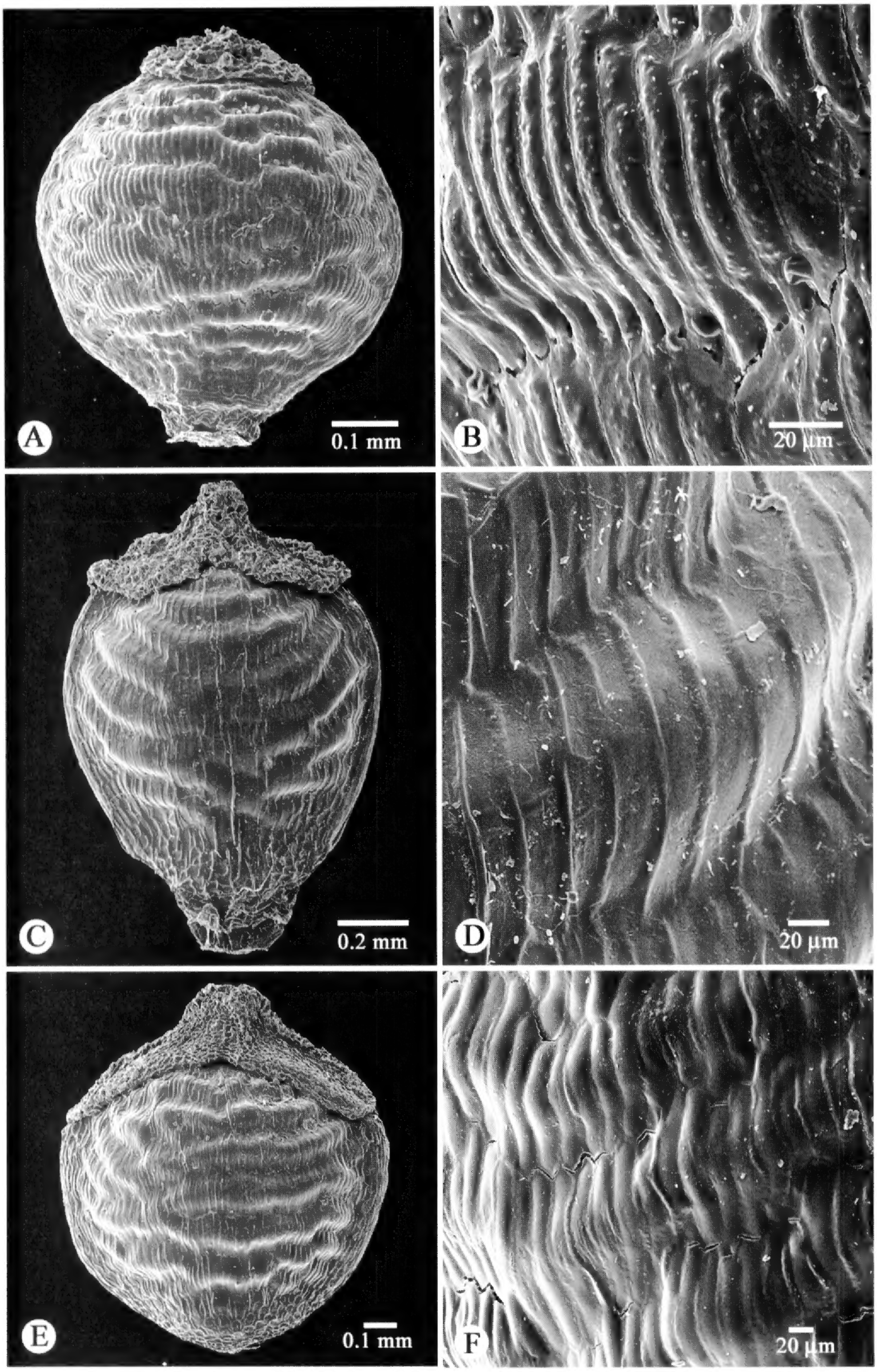


Fig. 85. A-B. *Rhynchospora tenella*. A. achene. B. detail of pericarp. C-D. *Rhynchospora tenuis* subsp. *tenuis*. C. achene. D. detail of pericarp. E-F. *Rhynchospora tenuis* subsp. *austrobrasiliensis*. E. achene. F. detail of pericarp. (A-B, from *Jansen-Jacobs et al. 1424*, MO; C-D, from *Glaziou 6924*, US; E-F, from *Horn 11027*, US).

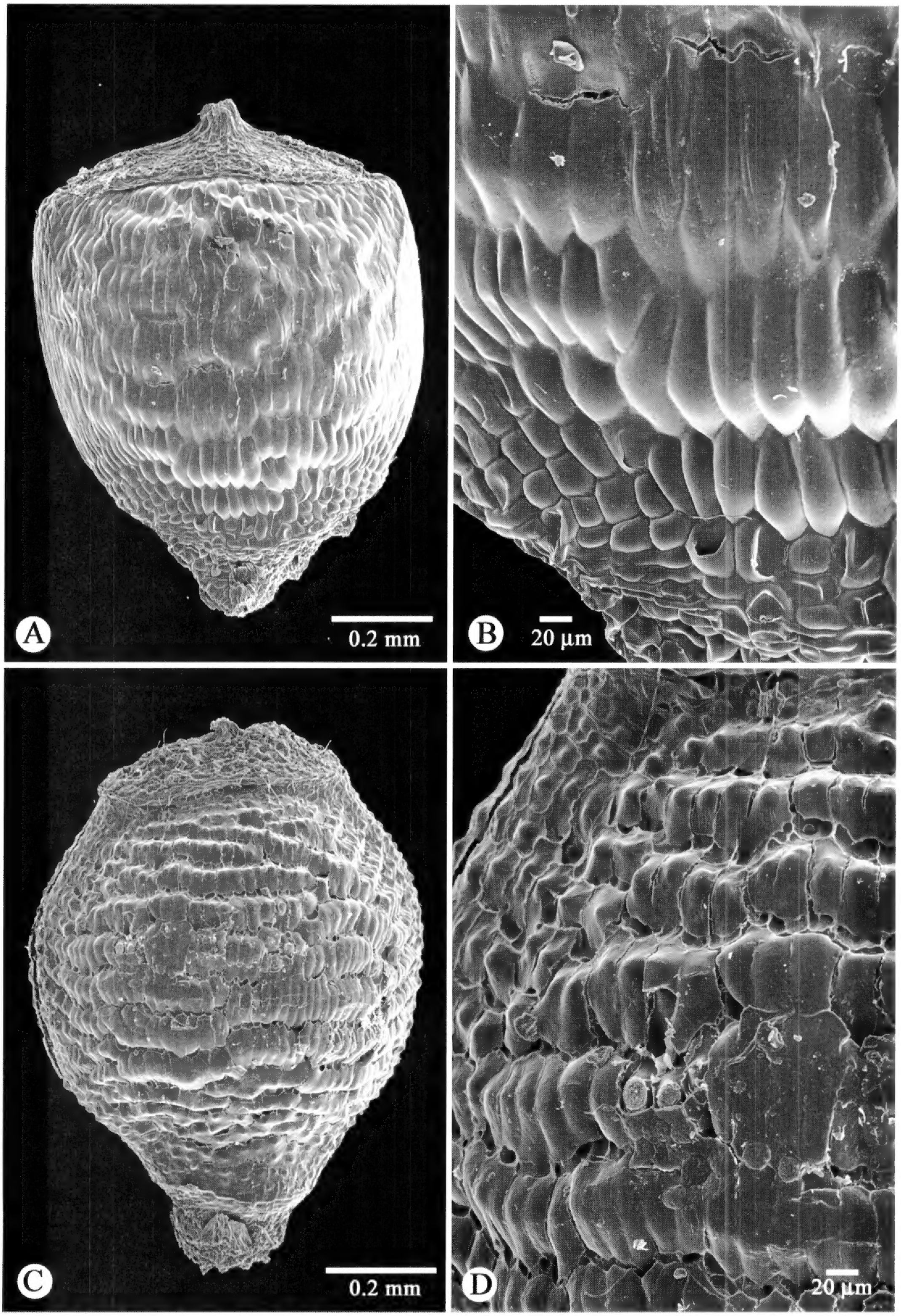


Fig. 86. A-B. *Rhynchospora spruceana*. A. achene. B. detail of pericarp. C-D. *Rhynchospora albida*. C. achene. D. detail of pericarp. (A-B, from *Lanjouw 339*, US; C-D, from *Maas et al. 5648* (U).

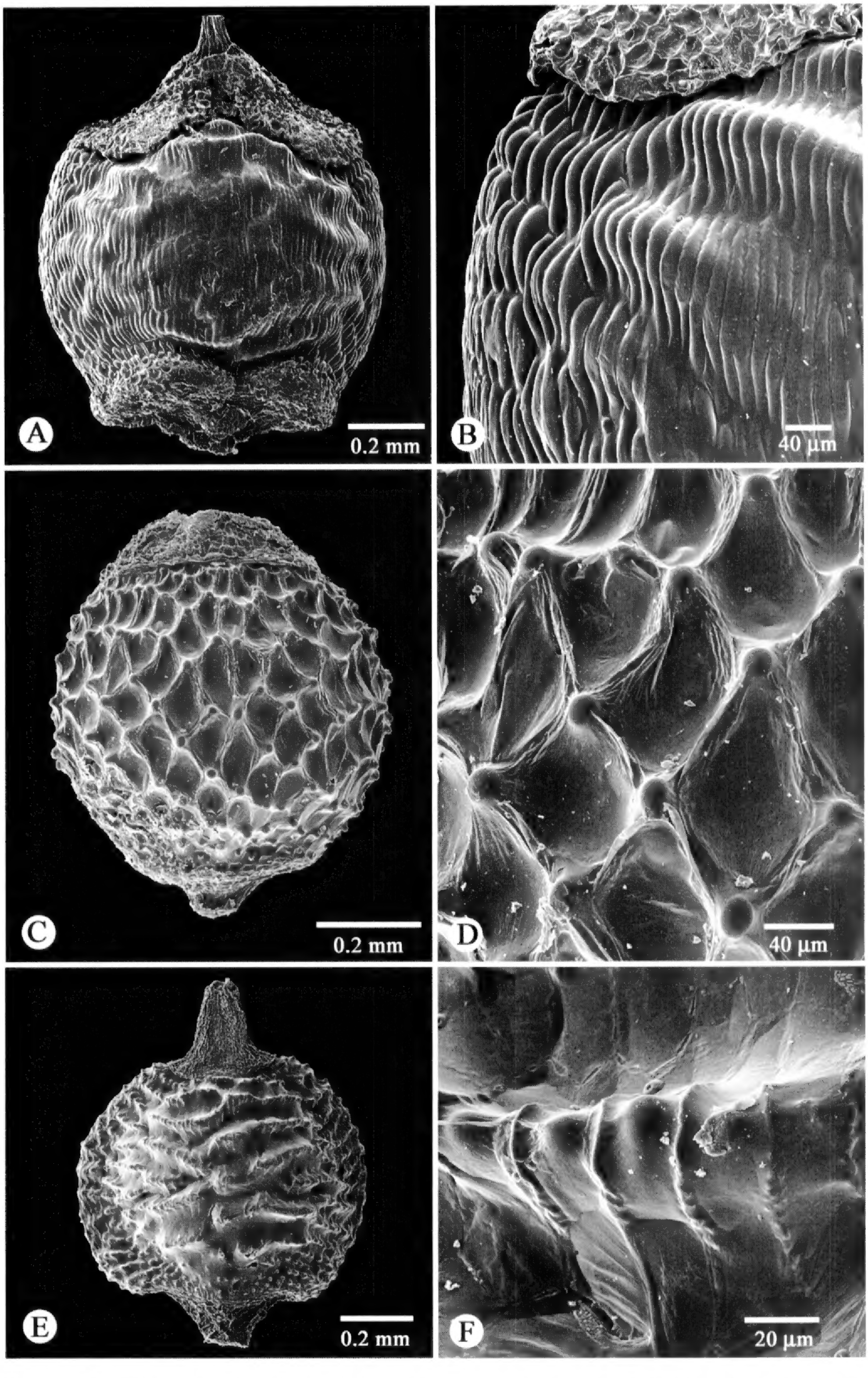


Fig. 87. A-B. *Rhynchospora riparia.* A. achene. B. detail of pericarp. C-D. *Rhynchospora hirsuta.* C. achene. D. detail of pericarp. E-F. *Rhynchospora cordatachenia.* E. achene. D. detail of pericarp. (A-B, from *van Donselaar 688*, U; C-D, from *Maas & Westra 3741*, MO; E-F, from *Raynal-Roques 21566a*, US).

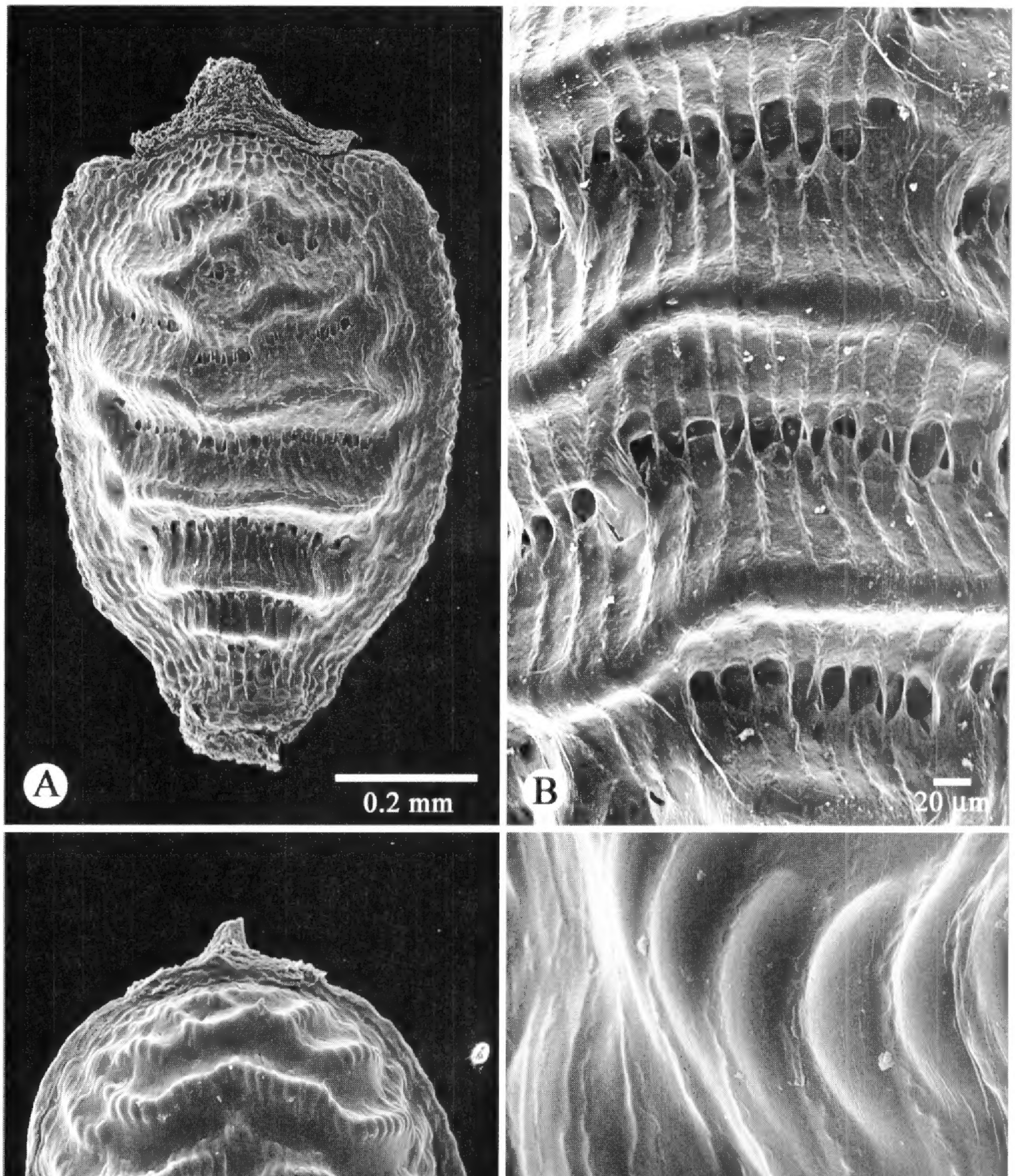


Fig. 88. A-B. *Rhynchospora sanariapensis*. A. achene. B. detail of pericarp. C-D. *Rhynchospora saxisavannicola*. C. achene. D. detail of pericarp. (A-B, from *Clarke 2438*, US; C-D, from *Oldenburger 254*, U).